American Journal of Public Health
and THE NATION'S HEALTH

Volume 31 September, 1941 Number 9

Administration of Medical Services as Part of a Health Department Program*

DANIEL L. SECKINGER, M.D., DR.P.H.
Assistant Health Officer, Coördinator, Health and Hospitals, District of Columbia Health Department, Washington, D. C.

AT present a vast amount of difference exists among health departments with respect to responsibility for the care of the indigent sick. Even in the smallest county health unit it is often necessary for the health officer with a county nurse to administer medical care to the indigent sick. In larger health organizations the amount of medical care varies with almost every organization, from clinic treatment of tuberculosis and venereal disease cases to the supervision of treatment for pneumonia, cancer, malaria, hookworm disease, direction of the physicians to the poor, management of communicable disease hospitals, to full responsibility for all phases of a medical care program of the indigent sick.

Surveys of medical and health facilities for states and municipalities in the United States have shown that no comprehensive and detailed account of community organization and management of public medical services is readily available. Michael M. Davis points out that "There are endless variations in the degree to which public medical services are performed by different governmental units, even within the same state." [1] It would be helpful in prescribing standards of medical care if a complete picture could be obtained of public health procedure and medical care services in relation to kinds of organization, costs, social status, and the professional and administrative relationships. This paper is primarily concerned with an account of correlation, coördination, and integration of service within the health department itself, having as its ultimate goal continuity of service. In many communities this is not possible because of the many units of governmental or private agencies which have more or less responsibility in the purely medical and sociological aspects of medical care.

The responsibility of the District of Columbia Health Department for the care of indigent sick began in 1937

* Read before the Health Officers Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

when the Congress transferred all facilities for the care of the sick from the Board of Public Welfare to the Health Department. The enabling act to make the transfer possible reads succinctly and briefly as follows:

> For the following hospitals and sanatoria, which, on and after July 1, 1937, shall be under the direction and control of the Health Department of the District of Columbia and subject to the supervision of the Board of Commissioners.

The Health Officer became Director of the Department of Health and Hospitals, and the Assistant Health Officer the Coördinator of the Health and Hospital Services.

The institutions and services transferred to the department include Gallinger General Hospital, Glenn Dale Tuberculosis Sanatorium, the Hospital Permit Bureau, the Ambulance Service, Physicians-to-the-Poor, and the administration of contracts for medical care with the Children's Hospital, Emergency Hospital, Casualty Hospital, and the Washington Home for Incurables.

The Gallinger General Hospital is an institution of 1,105 beds, with departments of surgery, medicine, obstetrics and gynecology, pediatrics, contagious diseases, psychiatry, tuberculosis, laboratory, x-ray, and other specialties appropriately placed under the main departments mentioned above. There are also some of the usual outpatient clinics of a large hospital.

The Glenn Dale Sanatorium is an institution of 760 beds with ample facilities for the complete care of tuberculosis cases, including medicine, surgery, x-ray, laboratory, heliotherapy, and occupational therapy.

The Hospital Permit Bureau has a full-time physician in charge, and a corps of medical social workers and clerical personnel to determine eligibility and issue permits to hospitals and clinics.

Physicians-to-the-Poor or City Physicians (12 in number) in their respective districts render domiciliary care on part-time salary to the indigent sick, while two others are assigned to emergency service throughout the District.

The Ambulance Service consists of government-owned ambulances for transportation of patients to and from hospitals, and there are also contracts with two private hospitals for emergency ambulance service to transport emergency cases to hospitals for outpatient and hospital emergency care.

The department also administers contracts with two private hospitals for the care of emergency cases and with another for the care of indigent sick children.

COÖRDINATION AND CONTINUITY OF SERVICE

A review of the several bureaus of the Health Department proper indicated that correlation of the work of the Bureau of Maternal and Child Welfare with the hospital services offered the greatest opportunity for immediate results. The infant mortality rate for Washington in 1936 was 72.0, the second highest among the 13 largest cities in the United States of above 500,000 population, and this in spite of the fact that previous well intentioned efforts to offset high infant mortality in Washington had resulted in the delivery in the hospital of more than 90 per cent of all patients, both white and colored. Under this program of hospitalization at Gallinger Hospital patients overflowed from the wards into the corridors, and even then it was necessary to establish a 30 bed overflow ward and nursery in an unused wing of the psychopathic building at a distance from the obstetrical department. This resulted in disorder and seriously overburdened the nursing staff. The superintendent of the hospital, a most resourceful person, rightfully stated that

he could not turn these patients away when they appeared at the hospital actually in labor.

There was a very evident flaw in the obstetrical program for the care of the indigent in the community which apparently could not be removed prior to the amalgamation of the health and hospital program. The Health Department operated prenatal clinics in the community with competent physicians in charge and public health nurses to assist with the clinic and field program, while the Board of Public Welfare did everything possible to care for those who came to the hospital in labor. Yet year after year the Health Department gave prenatal instruction to an average of only 600 patients, in spite of painstaking efforts to get patients to the clinics, while more than 2,000 indigent patients were delivered yearly at Gallinger Hospital, mostly without prenatal care. The disproportion between prenatal clinic patients and hospital deliveries furnished the key to the perplexing situation. To rectify this condition, soon after amalgamation of the health and hospital services, the Hospital Permit Bureau was instructed to issue no hospital permits for obstetrical patients until approval had been issued by the Clinical Director of Maternal Welfare. The result was an increase in prenatal patients from 600 to more than 3,000 within one year, while the hospital deliveries decreased from 1,956 in 1937 to 1,683 in 1938. It was, therefore, possible to close the obstetrical annex ward at Gallinger Hospital and to clear the corridors of patients, without new financial outlay for capital construction and maintenance. What became of the excess number of patients who otherwise would have been delivered at the hospital? Arrangements were made with the outpatient delivery services of Georgetown, George Washington, and Howard Universities for delivery of patients in the home by students under direction of competent obstetricians.

In actual practice the Clinical Director of Maternal Welfare reviews histories of all prenatal patients 6 weeks before the expected date of confinement. He also reviews the report of the public health nurse as to whether conditions in the home are suitable for home delivery. An unsatisfactory physical or home condition warrants hospital delivery, the patient is instructed to apply at the Hospital Permit Bureau for permit to enter the hospital, and the Nursing Bureau and Permit Bureau are apprised of this decision. A report of the patient's physical and home condition is forwarded immediately to the hospital. In case home delivery is decided upon, the physical history is forwarded to the medical school outpatient delivery services, and nurses assist the patients in making necessary preparation.

After delivery a brief report of the obstetrical history is forwarded from the hospital or medical school outpatient services to the Bureau of Maternal and Child Welfare where it is recorded for future reference. A close working relationship has been established between private agencies and the Health Department, resulting in an extensive community program. There are now more than 4,000 prenatal patients receiving care by the department constantly, out of a total of 13,981 births for the city, and more than 500 prenatal cases are currently being treated for syphilis.

The fall in the infant death rate has been rapid, from 72.0 in 1936 to 61.0 in 1937, 48.1 in 1938, and 48.0 in 1939. Sharing in this record of reduced infant mortality has been the strengthening of facilities for continuity of care between the obstetrical services and the infant and child guidance clinics. It is believed that still further mortality reductions will be made through the inauguration of improved nursing routine in institutions for the care of

infants, particularly of prematures, which is now in the process of development at Gallinger Hospital.

The establishment of coördination and continuity of care for other bureaus with the hospital services, while probably not as dramatic from the point of view of mortality reduction, are nevertheless important. Among these may be mentioned tuberculosis, venereal disease, pneumonia control, and the service of physicians to the poor.

Washington during the years has gained an unenviable reputation for high tuberculosis mortality. An analysis of the underlying causes giving rise to conditions which place the city in second place among the 13 cities of above 500,000 population, need not be given here. Suffice it to say, however, that the nation's capital, with a population of 663,000 according to the 1940 Census, had the greatest percentage growth of all cities in its population group. Among its 176,000 Negro population the tuberculosis death rate was 225.7 in 1939, while that for the white race was only 35.7, which is surprisingly low.

The period of hospitalization and supervision of tuberculosis patients is long even under optimum conditions. For others, notably the chronic fibroid, sputum positive cases, it is practically endless. The medical, nursing, and sociological problems that arise in regard to these cases tax the endurance of directors of tuberculosis divisions and hospital authorities. The amalgamation of the health department and hospital services has made it possible for staff conferences to be held within the department where representatives from the hospitals discuss problems of the management of individual cases with the personnel of the Bureau for Tuberculosis Control and vice versa, at which conferences the public health nurses and medical social workers are also in attendance. These conferences are held alternately at the Bureau for Tuberculosis Control on the one hand, and at the hospitals on the other They have proved to be indispensable in the program of tuberculosis control, which is continuous and uninterrupted through the clinics and hospitals.

Still another advantage accruing out of the combined services of the department and hospitals, particularly important in tuberculosis control, is the fact that a law has recently been passed which gives the Health Department authority to hospitalize communicable disease patients when the Health Officer states that it is in the interest of the public health.

Venereal disease control has been facilitated by the combined health and hospital services, although several years elapsed before the department was able, because of the lack of funds, to promote and coördinate the health and hospital services of the department in an effective plan. A long felt need of a venereal disease ward at Gallinger Hospital was provided, however, for acute, fulminating cases, or those who refused to comply with the regulations governing the control of venereal diseases. This service is available for both sexes, white and colored. The hospital also furnishes opportunity for the evaluation of the newer methods of therapy. The venereal disease control staff of the department and the hospital physicians have instituted carefully planned and controlled experiments which should add considerably to our knowledge of prevention and cure. Funds obtained from the U. S. Public Health Service grants for venereal disease control will very materially aid in the promotion of this work.

One of the most striking instances of reduction of mortality has occurred in connection with the pneumonia control program. Late in 1937 a pneumonia control service was inaugurated by the Department of Health and Hospitals in

coöperation with the white and colored medical societies. Two pneumonia consultants were added to the health and hospital staffs to assist private physicians in the management of cases and also to serve as consultants to the hospital staff in the care of indigents. In 1936 the death rate from pneumonia was 139.0. It dropped to 121.4 in 1937, 87.1 in 1938, and 72.3 in 1939. Complete laboratory services and serum and drug therapy for all types of cases are furnished by the department for the indigent.

Domiciliary medical care of the indigent in Washington is given by 14 practising physicians on part-time service. Twelve of these have specially assigned districts, while two are on emergency call constantly. These physicians treat many cases in the home who otherwise would be cared for at the hospital, which is not only costly, but unrestricted hospitalization also taxes the capacity of the hospital medical and nursing services. Monthly conferences are held for discussion of problems relating to domiciliary, outpatient, and hospital care. Attendance is required of the city physicians, the director of the Hospital Permit Bureau, the pharmacist in charge of the Health Department Drug Dispensary, the admitting officer at Gallinger Hospital, the director of the Medical Social Service Bureau, and frequently representatives from the Public Health Nursing Bureau and the Instructive Visiting Nurse Society attend.

The Hospital Permit Bureau, as the name implies, is responsible for the issuing of permits to the Health Department hospitals and the private contract hospitals. Patients admitted to these institutions must have resided in the District of Columbia for at least one year and be unable to bear the cost of hospitalization. The law provides exceptions for psychiatric, communicable disease, and tuberculosis patients. Residence eligibility and rates for these patients are determined by the Permit Bureau.

The work of the Permit Bureau is considered extremely important in that it provides a check and prevents pyramiding of costs to the taxpayer. It is believed that, unless this service is provided, any medical care program from the start is doomed ultimately to failure because of mounting costs. While hospital superintendents and their administrative staffs are responsible for collections, responsibility for determining eligibility and the rates of pay is vested in an autonomous admitting bureau under supervision of the Health Department which not only determines eligibility and fixes per diem costs but administers contracts with private hospitals for emergency dispensary and hospital care, including ambulance service. Contracts with private hospitals stipulate rates of pay for these services and all hospital bills for service rendered must be painstakingly examined and approved by the Director of the Permit Bureau before vouchers for payment are drawn.

MEDICAL SOCIAL WORK

The rôle of the medical social worker is fully recognized and appreciated in any large hospital plan of administration. The decision to establish a Bureau of Medical Social Service as an integral part of the Health Department organization grew out of the recognition of the importance of trained social service workers in any scheme of medical care and through necessity for coordination of medical social activities within the Department of Health and Hospitals. Previously the department had on its pay rolls a total of 13 medical social workers in the two hospitals, the Permit Bureau, and the Venereal Disease Bureau. Little or no efforts were made to establish continuity of care, and each group operated separately within

its particular sphere. A full-time director of medical social service was appointed and authorized to work out the details of unficaton of all social service activities within an autonomous bureau. This arrangement is highly successful, and that portion of the service which is concerned with hospital and clinic admissions is quite indispensable.

CONCLUSION

The present arrangement for health and medical care in the District of Columbia has now been in operation three years. An appraisal of the work can be made by the reduction in mortality and the response of the public and the medical profession. Outstanding mortality reductions have already been enumerated; the coöperation of the public has been most encouraging, in fact, almost universally approving, as shown in the failure of a proposal to return the hospitals to their former status under a reorganization plan for the District of Columbia. In hearings before the Commissioners 18 out of 19 civic organizations publicly opposed a change. Included among these were the Board of Trade, the Citizens' Associations, the Federated Women's Clubs, the Parent Teachers Association, the Manufacturers' Association, and a host of smaller organizations. The Commissioners themselves subsequently expressed their disapproval of any change in the status quo.

The local medical profession has supported the department on numerous occasions. Most recently it has proposed the establishment of a Bureau for Cancer Control under the Health Department with a full-time director in charge. The profession itself recognizes the responsibility of government in the care of the indigent sick, and it is believed that the local medical groups appreciate the desire of the department to protect the taxpayer and the profession itself through the inauguration of procedures to bring medical care more abundantly to the indigent sick, who have been unable to share in all the benefits that modern scientific medicine affords.

There is difference of opinion among health officers as to the advisability of the extension of health work to include general medical care of indigent groups. It is difficult to believe that this view can long prevail because of the considerable amount of emphasis that is now being placed upon the public health importance of the degenerative diseases of middle and old age groups. Probably in the future more assistance will be given to these groups, among whom there has been significantly little reduction in mortality during this century. The mounting death rates from heart disease and cancer are appalling, and as the middle and old age groups of the population increase numerically the problems of prevention among these groups are linked more and more with domiciliary, clinic, and hospital care.

At the beginning of the century, problems of the control of typhoid fever, diphtheria, and tuberculosis were paramount and required the greater part of the time of health department personnel. Today these diseases in most communities have been successfully attacked and are approaching eradication because of the application of sound public health methods. In the minds of many there is no longer need for the extension of facilities for care of communicable disease cases in hospitals, and in some communities plans for the future are being directed toward provision for the care of older age groups. If the problem of the control of communicable diseases is reduced to a greater extent in the future, it appears that public health will have reached a goal.

There is little doubt that most large health departments are fundamentally

equipped to assume larger rôles in any public health program of the future. The guiding minds that organized prenatal obstetric outpatient delivery service, child guidance clinics, tuberculosis and venereal disease control bureaus, and extensive typhoid and diphtheria control measures are amply equipped through training and experience to assume a rôle in the preventive medicine of the future which may embrace all or at least a part of the administration of medical care for the indigent. Nowhere in the community today may there be found individuals who through training or experience are so well equipped as are health officers to assume the larger administrative functions of prevention and medical care. It is admitted that the health officer, obligated with such responsibilities, will be called upon to establish new relationships and organize services not in line with past responsibilities; but since he has been called upon to organize medical bureaus and select personnel for administration within his department, he can with a like degree of efficiency select hospital superintendents or other responsible personnel to administer new medical care services.

The experience of the District of Columbia Health Department indicates that the amalgamation of Health Department and hospital services has resulted in better medical care, with consequent lowering of mortality from preventable conditions especially; it has reduced costs to the taxpayer because of established continuity and better routing of cases for domiciliary or hospital care, and improved the program of prevention, because the Health Department stands in close relationship to the hospitals where communicable diseases and other preventable conditions are treated.

REFERENCE

1. Davis, Michael M. *Public Medical Services*, 1937, p. 137.

Control of the Venereal Diseases in Civilian Areas Adjacent to Concentrations of Armed Forces*

A. B. PRICE, M.D., AND F. J. WEBER, M.D.
Passed Assistant Surgeon, Louisiana State Board of Health, New Orleans, La.; and Assistant Surgeon, U. S. Public Health Service, Regional District 4, New Orleans, La.

THE present limited emergency has brought into focus certain problems of public health in those areas where military or naval forces are assembled. Prominent among these is the problem of venereal disease control which, because of the many social and medical factors involved, is particularly difficult of solution. A satisfactory solution of this problem, however, is imperative.

During the past year the authors have actively engaged in venereal disease control in two of the large maneuver areas in the southern states. As a result of this work we have come to recognize the necessity of certain procedures and have, likewise, been in a position to judge the efficacy of such measures in the control of venereal disease. Therefore, we propose in this paper to discuss the special nature of the problem in training areas, together with what we believe to be practical proposals for its solution.

Available records indicate that the great majority of sexual exposures of enlisted men is with prostitutes of one sort or another. In one of the areas studied during the winter of 1939–1940, 112 men of 120 questioned named a prostitute as the source of their infection. Since prostitutes are admittedly a highly infected group, the extent of the danger is more clearly evident.

In this same area, 180 women engaged in the practice of prostitution were subjected to medical examination and 37 per cent were found to be infected with syphilis and 10 per cent with gonorrhea. We were limited by existing circumstances to the employment of one and, at the most, two vaginal smears in the diagnosis of gonorrhea in this group. Therefore, we feel that better diagnostic facilities would have revealed a greater number of gonococcal infections than were actually discovered.

That age old institution, the "red-light" district, is not the only factor with which venereal disease control officers and law enforcement authorities have to contend. Within the past decade, the mushroom growth of the "honky-tonk" (combined dance hall and beer parlor), the roadside cabin, and the peripatetic operator whose activities are abetted greatly by the development of modern transportation, have all combined to complicate the problem. For example, in the maneuver area mentioned, 63 venereal disease patients of

* Read at a special session on The Control of Venereal Diseases in a National Defense Program of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

120 questioned attributed their infections to prostitutes employed in "honky-tonks" while only 15, or 12 per cent, named inmates of recognized houses of ill-fame.

Of the venereal infections contracted by troops, gonorrhea exceeds all others in number. The incidence of this disease in the maneuver areas studied was found to be 4 to 10 times greater than syphilis, while cases of chancroid, lymphopathia venereum and granuloma inguinale were of infrequent occurrence. This high attack rate for gonorrhea is a serious problem, inasmuch as it means a loss of many days from duty and greatly augments the cost for hospitalization of troops.

In evaluating various procedures to meet the situation, the authors feel that a *sine qua non* in such training areas is the presence or establishment of full-time local health services manned with qualified personnel. This is essential to the development of a complete liaison between military and civilian authorities in matters of mutual health concern. In this way, venereal disease control can be correlated more effectively with other important health activities which are necessary to safeguard the health of both troops and civilians.

As a necessary corollary, it follows that military and naval officials should exercise close coöperation on their part with local and state health authorities. Since the public health situation in the training center and the adjoining civilian area is a matter of concern to both, provision should be made for the exchange of pertinent information in health matters of mutual interest. This is best accomplished where all such information is transmitted through one authorized individual acting in the capacity of liaison officer between the military and civilian organizations. In some instances the local health officer may perform this function, but in large training areas where armed forces are present in considerable numbers, this work can be done more effectively by a specially designated officer who assumes the responsibility for correlating public health activities and who can effect the liaison between the civilian and military or naval authorities.

General experience indicates that, other factors being equal, the prevalence of venereal disease in any given area tends to be in direct proportion to the number of sexual exposures which occur. This seems to be true in our experience, for we have observed the highest rates among enlisted personnel stationed in the vicinity of communities where prostitution was permitted to flourish and where sexual exposures with this class were frequent. Therefore, the first question to arise is how the number of contacts with such infected persons may be appreciably reduced.

In the course of our work we often hear arguments advanced for the institution of segregated districts with licensed inmates who are subjected to periodic medical examination. It is our belief that, aside from obvious social and moral considerations, such a system should be prohibited because it has proved to be a universal failure wherever tried, in so far as the prevention of venereal disease is concerned. The extensive studies of Flexner, Johnson, *et al.* demonstrate that only a comparatively small number can be so segregated; that a rapid turnover in the inmates of such districts is a recurring phenomenon; and that medical inspection is barren of any genuine results for reasons that are obvious to students of venereal disease.

The repression of prostitution is a community responsibility and one over which military authorities have no direct control. Therefore, an effective solution of this problem will depend upon strict enforcement by the police powers of existing laws dealing with the practice of prostitution. However, such

enforcement to be effective requires a responsible public opinion to back up police officials. In addition, such law enforcement must not only be concerned with the activities of prostitutes themselves, but extend as well to the owners and operators of houses classed as brothels, tourist camps used for immoral purposes, as well as "honky-tonks," hotels and rooming houses where open or clandestine prostitution is tolerated. Also, where troops are on the march, police officials will have to be alert for camp followers who always serve to aggravate the local situation.

The writers recognize the fact that such enforcement measures are not always easy to execute. However, wherever they have been earnestly applied, the results have been well worth the effort in terms of diminished exposures to women of this class.

Assuming that the civilian community is doing its part in the repression of prostitution in whatever form it may exist, what further steps should be taken by the civilian and military or naval officials to decrease the incidence of venereal disease in their respective populations? Inasmuch as both the civilian and military groups have a mutual obligation, how may they most effectively unite their efforts in the matter of venereal disease control?

First, let us state that the responsibility for making early diagnosis, rendering specific treatment and the employment of good epidemiological procedures, rests on both. In the case of early diagnosis and treatment, the armed forces enjoy an advantage over most civilian communities because of invariably excellent facilities for such diagnosis and treatment, together with the fact that better control of patients can be exercised. On the other hand, in many civilian communities it is hardly to be expected that venereal diseases will be recognized as promptly and treated to the point of non-communicability or "cure." Since many of these individuals have frequent sexual contacts with the military population, one of our main problems is to find a way to detect such infections earlier so that specific treatment can be instituted.

Therefore, with the object of bringing as many as possible of these civilian sources of infection under control, a system has been devised in coöperation with military and naval officials in which an attempt is made to identify and locate the source of infection in the case of each enlisted man contracting a venereal disease. We have found that the employment of a simple questionnaire filled out at the time diagnosis is made proves quite helpful in identifying sources and contacts. This questionnaire embodies such essential information as the following:

Name of patient
Diagnosis
Date and place of intercourse causing infection
Name and address of woman, if known
Physical description and attire of woman
Method of procurement
Prophylaxis taken
Sobriety of patient

In using this form, promptness is essential on both the part of the medical officer who completes the form and the health officer instituting the investigation, since a difference of a few hours frequently decides the result. In large training areas where sexual exposures are apt to be many, it has been found best to entrust the analysis of the data contained in these sex contacts forms to a specially designated liaison officer who has the authority to take appropriate action in conjunction with local governing officials.

This information is given quite willingly by the enlisted man and in our experience refusal or dissimulation is rarely encountered. In most cases, the full name of the contact is unknown and usually a first name or nickname is

all that can be obtained. However, other data such as physical description and place of exposure is surprisingly good and often leads to a detection of the source. This is particularly true where one woman has transmitted infection to several men. To give an example from our recent experience, a prostitute was located who was apparently responsible for the development of gonorrhea in at least 8 men. All 8 patients gave a remarkably uniform physical description of their contact, although the latter individual was a street walker and the exposures occurred at different places and at different times. With this description the police were able to locate the woman in one of her usual haunts and have her report for examination and treatment.

The successful tracing in the instance cited is an example of how the police may prove of great assistance in problems of this kind. Since most professionals are known to the man on the beat, a good description will often suffice even in the absence of other data.

In some areas a similar sex contact form is filled out at the time the enlisted man takes prophylaxis. Although the disclosure of such information is optional, our experience thus far indicates that refusals are rare, and it is our belief that this procedure does not discourage the individual from reporting for prophylaxis. This information is then turned over to the maneuver area health services, thus yielding valuable clues regarding the location of prostitutes in advance of the occurrence of clinical cases. This proves particularly helpful where troops move from one region to another and some develop clinical manifestations after leaving the area where infection was acquired.

Epidemiological procedures of this nature must, of necessity, be carried out in the face of many difficulties. We can, of course, expect no genuine coöperation from the infected prostitute in having her reveal the names of her sex contacts, even if she knew or could remember. Therefore, our main reliance must be placed upon the testimony of the men infected, together with the degree of detective skill developed by health officers working with the problem. Unless everyone concerned joins whole heartedly in a united effort, venereal disease control in these areas will be difficult.

It is obvious that any community faced by this special problem should be conducting a good general venereal disease program. Existing diagnostic and treatment facilities should be increased if they are inadequate. If a sound program is already in operation, the health officer can institute certain anticipatory control measures before large troop concentrations assemble in his area. A roster of all female employees in establishments serving food and drink may be prepared and a routine examination for communicable disease should be conducted, including the performance of at least one standard serological test for syphilis. This roster should prove to be of great aid later when cases of venereal disease are reported in troops, since many of the sexual contacts of enlisted men are with individuals of this group. The proper enforcement of sanitary regulations may succeed in closing some of the worst type of cafes, beer parlors, and tourist camps, or have the effect of dampening some of their activities.

The health officer may find the local medical society to be of valuable assistance. It is not uncommon in some places for certain physicians to issue medical certificates to prostitutes asserting freedom from venereal disease. As a result, prostitutes in possession of these certificates regard them as a license to operate and by their display lull patrons into a false sense of security. By taking up this matter at one of the medical society meetings, the health officer will usually succeed in having the practice discontinued.

Education, of course, plays a large part in the program. The public should be informed not only concerning the dangers of venereal disease and how such disease can be recognized in its early stages, as well as the importance of early treatment, but should also be told of the measures taken for its protection, including the location of treatment centers.

Another important aspect of the venereal disease program is that due consideration should be given to the wider prevalence of gonorrhea. Unfortunately, this disease has been much neglected in the past, and most attempts at its control have been spasmodic. The diagnosis of gonorrhea in women, particularly where it exists in chronic form, offers quite a problem inasmuch as we lack a simple scientific test that is comparable to the standard serologic tests for syphilis in sensitivity or specificity. Bacteriological smears fall far short of the ideal, while culture methods are difficult and time consuming, an important point to consider in problems of this nature where time is such an important factor. In this work, many cases of gonorrhea will escape detection if positive bacteriological evidence is required. Therefore, in deciding whether or not to treat, it appears reasonable enough to accord due weight to clinical and epidemiological findings indicating the individual to be a purveyor of gonococcal infection even though gonococci cannot be demonstrated.

In addition to providing adequate diagnostic and treatment facilities for its citizens and assisting in establishing necessary prophylactic stations in convenient and desirable locations, community leaders should offer their fullest coöperation to army and naval officials in providing for the welfare of enlisted men who visit the community during off-duty hours. They should coöperate in instituting and maintaining healthy recreational facilities for men on leave and make a genuine effort to lead them to amusements and pleasures that will improve rather than deplete their mental and physical energies.

In the final analysis, the worker in this particular field will have to trust his own personal judgment in dealing with many of the situations that develop. Ways and means must be devised through which established principles of venereal disease control may be applied to the special problem considered here. The health officer's course should be pursued with tact, but without losing sight of his objective, and the attainment of that objective will depend in large measure upon how successfully the parties concerned can be persuaded to discharge their full duties.

In conclusion, we can state that the outlook for venereal disease control in the training areas is favorable. We hope that the presentation of this subject will stimulate interest in a very important matter which vitally concerns adequate preparation for the national defense.

An Outbreak of Endemic Typhus Fever in Nashville, Tennessee

Its Epidemiology and Control

C. B. TUCKER, M.D., THOMAS V. WOODRING, M.D., AND HARRY C. ESSICK

Director, Division of Preventable Diseases, Tennessee Department of Public Health; Assistant Health Officer, Nashville, Tenn.; and Senior Sanitary Inspector, U. S. Public Health Service, Savannah, Ga.

ENDEMIC typhus fever is known to have been present in the southeastern states as early as 1913. Dyer [1] has indicated that the gradual increase in the number of reported cases in southern states from 1923 to 1931 might be explained by increased recognition of cases by physicians but that the sharp increases in 1932 and 1933 surely could not be explained on those grounds alone. As pointed out by Dyer [1] and by Baker, McAlpine, and Gill,[2] the disease since 1929 has shown a tendency to spread inland from the Atlantic and Gulf coastal cities.

The first case of endemic typhus reported in Tennessee was in 1926 as shown in Table 1. Prior to 1925 no records of morbidity were kept by the Tennessee Department of Public Health and, therefore, nothing is known as to the occurrence of cases before that year. Some doubt may be raised as to the accuracy of diagnosis or as to the source of the infection in 6 of 9 cases reported during the period 1926–1934. Prior to 1934 no separate account was kept of nonresident cases. Three cases reported between 1926 and 1934 were known to be nonresident cases.

Among the 159 cases reported during the period 1935–1939, 28 were reported from strictly rural regions and may not have been endemic typhus fever. In 1939, 8 cases reported from rural areas as endemic typhus fever were found upon investigation to be: Rocky Mountain spotted fever in 6 instances, tularemia in 1 instance, and a Salmonella infection in 1 instance. These misdiagnosed cases give sufficient reason to doubt the diagnosis of a number of cases reported in the past as endemic typhus fever.

TABLE 1

Endemic Typhus Fever Cases Reported in Tennessee, 1926–1939

Year	*Number*	*Year*	*Number*
1926	1	1933	1
1927	0	1934	0
1928	2	1935	8
1929	2	1936	6
1930	0	1937	21
1931	1	1938	24
1932	2	1939	100

FEATURES OF THE OUTBREAK

A considerable outbreak of typhus fever occurred in Nashville in the autumn of 1939. Nashville serves as a freight terminal on the Cumberland River and, besides being a river terminal, it is an important railway center

for three railroads and is a trade center for central Tennessee, south-central Kentucky, and northern Alabama. There are various local industries, among which are grain mills, feed mills, wholesale groceries, and other establishments handling foodstuffs of different kinds. The estimated population of Nashville for July 1, 1939, was 166,312. Of this number 120,006 (72 per cent) were white, and 46,306 (28 per cent) colored.

Incidence—In 1935 endemic typhus fever was first definitely diagnosed and reported among residents of Nashville, 6 cases being reported that year. In Figure 1, there are three areas marked 1, 2, and 3 which represent probable foci of endemic typhus infection among rats. Four of the 6 cases in 1935 occurred among employees of a large feed mill in Area 1 and among residents of the immediate vicinity. The mill is located adjacent to the main lines of the Nashville, Chattanooga, and St. Louis and the Louisville and Nashville Railroads, a short distance north from where the two railroads converge and extend to the freight and passenger terminals. It seems reasonable to believe that infected rats were on freight cars entering the city from the south, and left the train to feed or were unloaded with bulk grain at this mill. Subsequently, a definite focus was established among rats having harborage in the mill and its immediate vicinity. It is probable that this was the first focus to be established in Nashville. However, infected rats had probably extended to other areas before cases occurred or were recognized in Area 1, because 2 other cases were reported in 1935 in individuals whose place of employment was just north of Area 2.

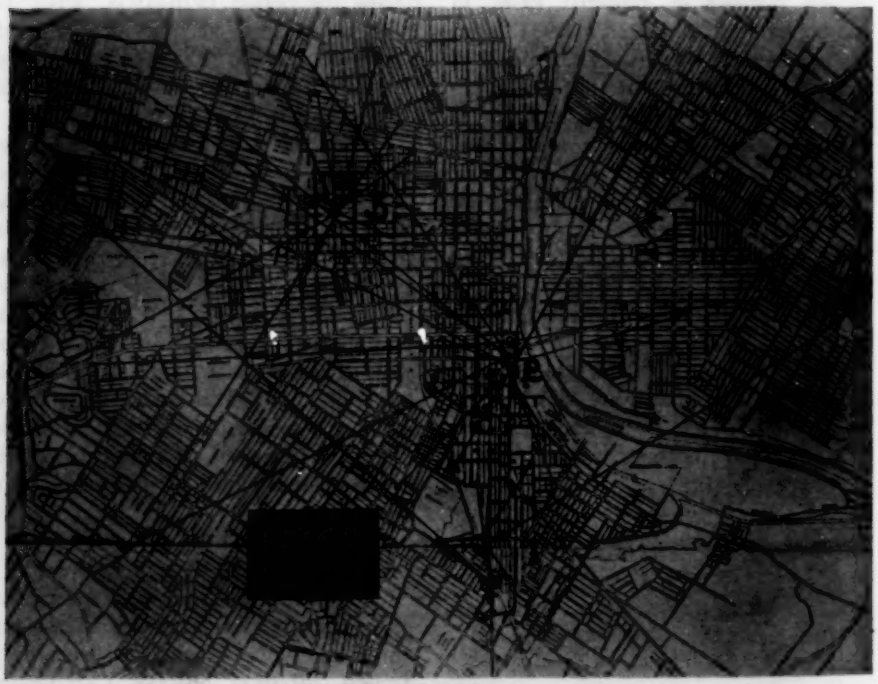


FIGURE 1—Typhus fever in Nashville, Tenn., during 1939. Black dots represent residences of cases. Lines extend from residences of cases to foci of infection. Three areas are marked denoting location of intensive rat control measures.

In 1936, 2 cases were reported among employees of the mill in Area 1, and 1 other case in a person whose place of employment was just north of Area 2. In 1937, 13 cases were reported in the city. Two of these were employees of the same mill in Area 1, and 3 were residents of the immediate vicinity. Six cases were reported in employees of a feed mill in Area 2, with probable source of the remaining cases unknown. Of the 9 cases reported in 1938, 2 were employees of a poultry house in Area 2, and 7 were employees of two grain mills in Area 1. During 1939, 75 cases of endemic typhus fever were reported to the City Health Department. In addition, 5 cases in persons living in Davidson County outside the city gave histories which suggested that their source of infection was in Nashville.

Seasonable Distribution—The dates of onset, by months, of the cases reported in 1939 were as follows:

January	3
July	1
August	1
September	20
October	23
November	24
December	3

From these figures it is seen that 67 of the 75 cases occurred in September, October, and November. In states to the south and southeast[2, 3] the first cases have usually been seen in June or July, the incidence reaching a peak in September, followed by a decline in October and November. Perhaps some differences in temperature, humidity, or a combination of factors affecting the rat flea play a part in the later seasonal incidence of the disease in Tennessee.

Geographical Distribution—The place of residence for each case reported during 1939 is spotted on the map (Figure 1). The probable source of infection is indicated by lines extending from the residences to the different foci. No lines are seen extending from the residences within each area or from residences of patients where no source of infection could be determined. By careful history taking it was possible to determine the probable source of infection in 70 of the 75 cases.

Occupational Influence—The cases for which the source of infection could be determined were either in employees at or in visitors to grain mills, seed stores, groceries, restaurants, and poultry houses, or among persons living or working in buildings in the immediate vicinity of such places which offered generally good harborage for rats.

Two of the cases were in persons whose occupation was that of commercial rat exterminator. Another case was in a policeman whose area of duty was in a residential section of the city but who spent several hours each Saturday morning in a barber shop which was adjacent to a poultry house in Area 2. Two barbers working in this shop had the disease at about the same time as the policeman.

TABLE 2

Distribution by Color, Sex, and Age of Cases of Endemic Typhus Fever Reported in Nashville, Tenn., in 1939

	Total		White		Colored	
Age Group	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
All Ages	55	20	43	17	12	3
0– 9 years	1	1	1	1	0	0
10–19 years	2	2	2	2	0	0
20–29 years	13	5	12	4	1	1
30–39 years	12	2	10	2	2	0
40–49 years	10	4	6	4	4	0
50–59 years	12	4	8	4	4	0
60–69 years	5	1	4	0	1	1
70 years and over	0	1	0	0	0	1

Color, Sex, and Age Distribution—Table 2 gives the color, sex, and age distribution of the cases. Sixty (80 per cent) of the cases occurred in white persons, and 15 (20 per cent) in Negroes. This is a rate of 50 per 100,000 population for whites and a rate of 32.4 per 100,000 population for Negroes.

In order to have a complete record of cases, the employers of the major food-handling establishments in the three areas were requested to report absences from work. Visits were made to the homes of employees when reports were received. Twelve cases among Negroes were found by these investigations. Of the 12 cases, 5 were not under the care of a physician. The others had been seen by physicians and their illness diagnosed as typhoid fever, malaria, influenza, or some other condition.

Twenty-one cases, 9 of which were white, and 12 colored, occurred among employees of four large feed mills These mills employ 334 persons, 119 of whom are white, and 215 colored. The attack rates in this small population were 7.6 per cent among the white employees, and 5.6 per cent among the colored employees. Although no general conclusion can be drawn from these figures, it appears that here the incidence of the disease was nearly as high among the colored race as among the white race.

The mild manifestations of the disease and the lack of medical care may be responsible for failure to diagnose and report some cases among Negroes. Baker, McAlpine, and Gill,[2] in discussing the epidemiology of the disease in Alabama, state that reported cases have been ten times as common in the white race as in the colored race. They later add that the apparent high case fatality rate among Negroes in that state may to a considerable extent be due to less complete recognition and registration of cases for this group. Only in a large population in which all white and colored people are equally exposed and cases are accurately recorded could a definite decision be reached with regard to racial susceptibility to this disease.

The disease was more common among adults than among children and more common among males than among females. This is usually the case, since endemic typhus fever is in the main a disease occurring among employees in certain industries.

Clinical Manifestations—The clinical manifestations were in the main similar to those which have been previously described.[1-6] A rose to dark red, macular (in some instances maculopapular) rash was first seen in the majority of cases on the 5th or 6th day of the disease. The rash usually appeared first on the lower chest or upper abdomen. The erythematous lesions did not become definitely petechial or hemorrhagic except in 2 patients. It has been stated[4] from observations elsewhere that the rash becomes petechial in the severest cases. In Tennessee it appears that a petechial eruption is an exception rather than a rule. This point is of value in the differentiation of this disease from Rocky Mountain spotted fever.

In the colored patients no rash could be definitely observed, although in 4 cases lesions were present which were suggestive of a rash but could not be differentiated from natural blemishes. No rash could be observed in 2 of the white patients.

The average duration of fever in hospitalized cases was 15 days. The maximum duration was 40 days (including complications) and the minimum 9 days. Forty-five (60 per cent) of the patients were hospitalized.

Agglutination of Proteus X-19 organisms with the blood serum of patients was present in significant titers (1:160 or more) in 73 patients. Agglutination tests with the serum of 2 patients were not made, but the clinical

and epidemiological manifestations were such that there appeared to be no question as to the diagnosis.

Two cases resulted in death, giving a case fatality rate of 2.7 per cent. Each of these cases died of a complicating pneumonia. One of the patients who died was a white male, age 65, and the other a colored female, age 60.

THE CONTROL PROGRAM

In the latter part of October, 1939, when it became evident that Nashville was experiencing a severe outbreak of endemic typhus fever, the Health Officer of Nashville, through the Tennessee Commissioner of Public Health, requested the U. S. Public Health Service to assist in the institution of rat control measures in this city. One of the authors, a sanitarian of the U. S. Public Health Service, was detailed to Nashville for that purpose. Prior to this time a sanitarian of the City Health Department, who was given training in rat control by the Tennessee Department of Public Health in 1937, had given some assistance to local business concerns in rat control.

The epidemiological picture of these known focal areas gave sufficient evidence that rat control measures should be concentrated first in these areas, in order to destroy as many infected rats as possible, and to prevent the infection from spreading to other areas if it had not yet done so. The method employed was essentially that which had been developed in Georgia jointly by the State Department of Health and the U. S. Public Health Service.[7]

In order to prevent the driving of infected rats out into the surrounding area, the program was started several blocks in radius from the main foci of infection with the plan of working inward toward the center of each focal area. The heavy lines shown around each area in Figure 1 signify the location where work was started. A large warehouse or grain mill near the center of the area was selected as the final

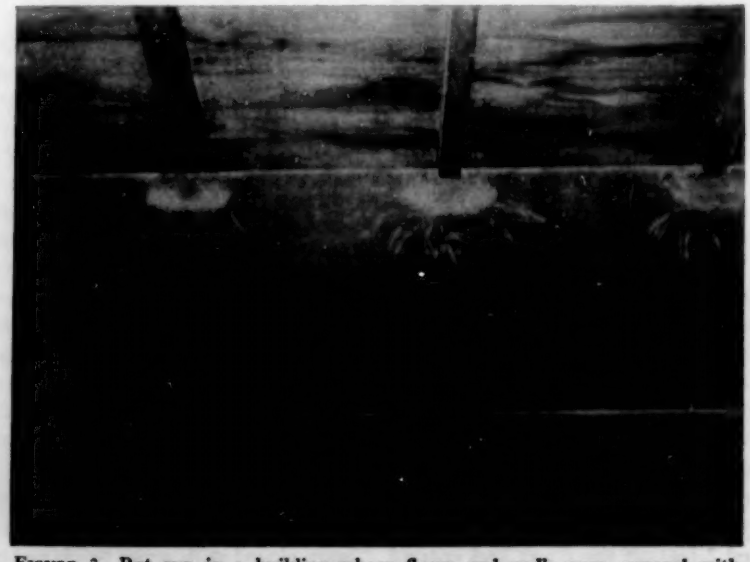


FIGURE 2—Rat run in a building whose floors and walls were covered with grain flour. Note white marks made by tails of rats.

FIGURE 3—A wooden building close to the ground. Rat runs may be seen through the grass and under the building.

location for completing the work. Figure 2 shows visual evidence of rat runs in such a building.

Thirty men employed by the city as laborers were divided into three groups with two sanitarians of the City Health Department as supervisors of each group. The workers in group 1 were used to clean the area by removing garbage, refuse, and trash; those in group 2 were used in gassing, poisoning, and trapping; and those in group 3 were used in rat-proofing buildings. A U. S. Public Health Service truck built for mosquito control work, equipped with an air compressor and 500 feet of hose, was used to supply compressed air for gassing purposes. Gas hand-pumps were connected to the hose, and buildings and burrows were gassed.

Starting at the periphery of the area and working toward the center, garbage, refuse, and trash were removed and alleys, basements, outhouses, and yards cleaned. In order to prevent rat harborage, material worth salvaging was stacked 2 feet off the floors and ground. Rat burrows were gassed with cyanide A dust and the openings closed with earth. Poison bait and traps were repeatedly placed in sections cleaned until the entire area was covered. By this method a clean, presumably rat-free area was established between central portions of the area and the surrounding territory.

As foodhandling establishments were reached, a survey of the buildings was made to discover the places where rats could enter (Figure 3). The owners of these establishments furnished the materials and the laborers employed by the city did the rat-proofing. All ventilators and sidewalk gratings were closed with 16 gauge galvanized iron sheeting perforated with ½ inch holes. All outside doors were flashed at the bottom with 24 gauge galvanized iron sheeting which was extended up on the corners of the doors and on the facings for a distance of 10 inches so that rats could not gnaw at the exposed edges. Holes found around plumbing and cables and other breaks in brick or stone construction were closed with scrap brick and mortar. A wall of corrugated galvanized iron

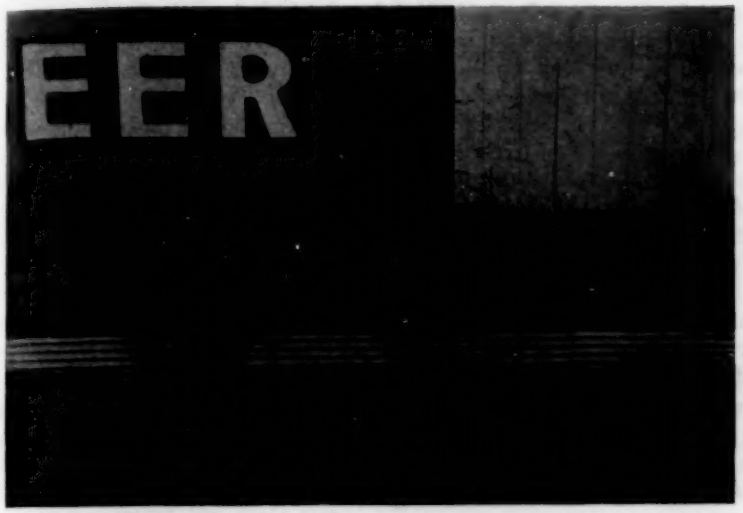


FIGURE 4—Another view of the building in FIGURE 3. A trench 2 feet deep has been dug around the building and a wall of galvanized iron roofing installed 2 feet below the ground level and several inches above. The top edge has been firmly nailed to the building.

(metal roofing) was installed in a trench to a depth of 2 feet around wooden buildings and extended several inches up the side with the top edges of the metal firmly nailed to the buildings. The average cost of material for rat-proofing a building was $7.56, with a maximum cost for any one building of $47.70 and a minimum cost of $2.00.

After the building had been made rat-proof from without, the basement was gassed with cyanide A dust and the remainder of the building with cyanide G fumigant. In order to make sure that all rats in the building were destroyed, poison bait and traps were placed in it for several weeks after gas had been used. Where rat-proofing was not done, buildings were first cleaned of refuse and trash, materials were stacked to prevent harborage, and then poisoning and trapping were carried on until it was evident that no rats remained.

Trapping was done exclusively with steel snap-traps, since these traps usually snare the rat without killing it. By use of this trap, fleas which do not usually leave live rats are prevented from migrating, and can be destroyed with the rat. The trigger of each trap was brushed with a small amount of anise oil which, besides destroying the human odor, attracted the rats. The traps were set with the jaws parallel to the runs, which usually were found along the walls of buildings, fences, etc. Rats caught in the traps were killed, placed in flea-proof bags, and incinerated in order that fleas present on them would be destroyed.

The bait was mixed in proportions of 1 part red squill, 2 parts cereal, and 8 parts meat. Oatmeal or cornmeal was used as the cereal constituent, and cheap ground beef or canned salmon as the meat portion. Each individual bait, averaging about ⅓ ounce, was placed in the center of ¼ of a cheap paper napkin which was then folded and twisted over the bait so that it was similar in appearance to a toy torpedo. At the time the baits were distributed, a cloth saturated with anise oil was tied

to the container in which the baits were carried. The baiter ran his fingers over this cloth before picking up the bait and placing it in the location desired. Fish bait was used in localities where cereal and grain had been freely accessible to rats, and beef bait was used where fish and poultry had been freely accessible to them. The poisoned bait was prepared at a cost of approximately 12 cents per lb. or ¼ cent per bait.

During the period November 9, 1939, to February 1, 1940, 3,268 rats were recovered and about 14,000 were believed to have been killed by poisoned bait. Of the rats recovered, 90 per cent were *Rattus norvegicus*, 8 per cent *Rattus alexandrinus*, and 2 per cent *Rattus rattus*.

POSSIBLE SPREAD FROM NASHVILLE

Among other cases of endemic typhus fever reported during 1939, 12 cases were reported in the small City of Lebanon, 30 miles east of Nashville on the Tennessee Central Railroad and also on a main arterial highway. This railroad has freight yards in Area 2 in the City of Nashville. These cases in all probability represent an extension of the infection from Nashville. During the autumn of 1939, 3 cases were reported from the City of Jackson, 142 miles west, and 3 from the City of Chattanooga, 138 miles southeast of Nashville. The cases in Jackson probably represent an extension of the infection either from Nashville or from Alabama, while those in Chattanooga probably represent a spread from Georgia.

DISCUSSION

The control measures instituted in Nashville were emergency measures aimed at preventing the spread of the infection to other parts of and outside the city. It is probable that infected rats had already moved beyond the known focal areas. The extension of rat control and rat-proofing to all parts of the city is indicated and is being planned.

The method of rat-proofing which has been briefly described in this report is only intended to prevent the entrance of rats into buildings. It requires constant maintenance in conjunction with poisoning and trapping of any rats which gain entrance. Such a program of rat-proofing is recommended for use in buildings already constructed, the procedure being attractive to merchants because of the low cost involved. On the other hand, complete and permanent rat-proofing of buildings already constructed, including the elimination of all rat entrances and all possible nesting places within the building, is not attractive because of its high cost.

The passage and the enforcement of a rat-proofing ordinance by city governments generally are advisable. Such an ordinance should require the rat-proofing of all buildings to be constructed, repaired, or remodeled, and should require maintenance after construction. A model ordinance has been prepared by the U. S. Public Health Service [8] covering all essential points. An ordinance has been drawn, based on this model ordinance, which is to be submitted to the City Council of Nashville for consideration. The proper collection and disposal of garbage, removal of litter, abolishment of dump heaps, insanitary privies and cesspools, and establishment of general cleanliness, including even the periodic cutting of weeds in open lots, also play an important part in rat control.

It is evident that endemic typhus fever is spreading into the interior of the United States from the original foci of infection on the south Atlantic and Gulf coasts. The infection already has spread as far north as Tennessee, the first known focus in this state being

found in Nashville in 1935. Meleney [9] has outlined the extent of the disease in the southern United States as of 1939. State and local health officials in general, and those of the southern states in particular, must seriously consider active programs of rat control and rat-proofing in all villages, towns, and cities. The institution of this program should not be delayed until after foci of the disease have been established but should be started immediately. Specially trained personnel are essential if a program is to be successful. Such a program will not only control but will also provide a barrier against endemic typhus fever and other rat-borne diseases such as bubonic plague, and will more than pay for itself by decreasing the great economic loss due to rats.

SUMMARY

1. The first case of typhus fever to be officially reported in Tennessee occurred in 1926. By January 1, 1940, 168 cases had been reported.

2. The first known cases of typhus fever in Nashville were reported in 1935. A focus probably was established first in the southern part of the city in a feed mill located on two railroads a short distance from where they enter the city. By January 1, 1939, 31 cases had been reported.

3. An outbreak * occurred in Nashville in 1939. Seventy-five cases were reported, of which 60 were among white persons and 15 among colored. The case fatality rate was 2.7 per cent.

4. One or the other of three foci in the city was determined as the probable source of infection for 70 cases.

5. Trapping, poisoning, removal of garbage and trash, and rat-proofing were done in each area, starting several blocks in radius from each focus and working inward toward the midpoint.

6. Foci of the disease have been established in three other cities in the state, representing a spread either from Nashville or an extension of the infection from Alabama and Georgia.

7. Since the disease is spreading inland from the original foci in the southeastern states, state and local health officials in general, and those of the southern states in particular, must consider seriously active programs of rat control.

REFERENCES

1. Dyer, R. E. Diseases of the Typhus Group in North America. *Canad. Pub. Health J.*, 28:1–9 (Jan.), 1937.

2. Baker, J. N., McAlpine, J. G., and Gill, D. G. Endemic Typhus in Alabama. *Pub. Health Rep.*, 50:12–21 (Jan.), 1935.

3. Rumreich, A., Dyer, R. E., and Badger, L. F. The Typhus-Rocky Mountain Spotted Fever Group. *Pub. Health Rep.*, 46:470–480 (Feb.), 1931.

4. Maxcy, K. F. Clinical Observations of Endemic Typhus (Brill's disease) in Southern United States. *Pub. Health Rep.*, 41:1213–1220 (June), 1926.

5. Lumsden, L. L., and Tucker, C. B. Clinical and Epidemiological Features and Differential Diagnosis of Rocky Mountain Spotted Fever and Endemic (murine) Typhus Fever. *J. Tennessee M. A.*, 32: 339–341 (Oct.), 1939.

6. Virus and Rickettsial Diseases. *Harvard School of Public Health Symposium Volume*, Harvard University Press, 1940.

7. Boston, R. J. Public Health Engineering Phases of Murine Typhus Control. *A.J.P.H.*, 30:619–626 (June), 1940.

8. Holsendorf, B. E., and Clark, P. W. The Rat and Rat-proof Construction of Buildings. *Pub. Health Rep.*, Supp. No. 131, 1937.

9. Meleney, H. E. The Recent Extension of Endemic Typhus Fever in the Southern United States. *A.J.P.H.*, 31:219–227 (Mar.), 1941.

* Since this report was prepared early in 1940, it is interesting to note the subsequent incidence of typhus fever in the city. Eighteen cases were reported during the year. During the first two months of 1940 and prior to the time control measures had been completed in Area 2, 3 cases occurred among employees of a freight depot in that area. During the summer and autumn of 1940, 4 cases were reported from the immediate section around Area 1, and 7 cases from the immediate territory around Area 2. Four cases were reported among employees of a dog food factory located about seven blocks from the center of Area 2. This represents a new focus of infection. In addition, 4 cases in residents of Davidson County may have obtained the infection within the immediate vicinity of Area 2. The location of probable sources of infection in 1940 indicates that it will be necessary to extend the control measures over a large area if the disease is to be held under control in Nashville.

Application of Epidemiological Method to a Study of the Distribution of Medical Care*

JOHN J. BOURKE, M.D., M.P.H., F.A.P.H.A., AND MARGARET BULLOWA, M.S.P.H.

Research Director, and Statistician, New York State Legislative Commission to Formulate a Long Range Health Program, Albany, N. Y.

IT is generally conceded that adequate medical care is an essential element in maintaining the health of the public even though controversy may still exist concerning the place of medical care in public health administration. If medical care is not secured the reservoir for illness is increased. Disturbed economic stability brings into play the adverse factors of inadequacy of nutrition, housing, and clothing. We have reached a point in modern medical and public health practice where closer fusion of preventive and curative services to each individual can result in increasing returns in community health. Therefore, knowledge of factors affecting the distribution of medical care is essential.

The purpose of this paper is to demonstrate that both the individual and community aspects of medical care may be profitably studied by the methods of epidemiologists. The broadening viewpoint in epidemiology, as expressed by Major Greenwood, "came to mean the study of disease, any disease, as a mass phenomenon. It differs from the study of disease by the clinician primarily in respect of the unit of investigation."[1]

The study of communicable disease deals with the characteristics of each disease and the population affected. Applying the epidemiological method to a study of the distribution of medical care, comparable factors are involved. Among the variables which call for study are types of illness and their amenability to medical treatment, the ability of the patient to recognize the need for medical attention and willingness to utilize medical care facilities when geographically and economically accessible. Characteristics of a population which are significant in studying medical care problems deal with population density, income level and sources, and extent of welfare assistance. A study of these factors, treated as mass phenomena, assumes more significance than a series of case histories.

The present-day interest in the organization and distribution of medical services emphasizes the need for reliable data. A knowledge of the epidemiology of medical care is vital to successful operation of proposed voluntary health insurance, group practice, or prepayment medical and hospital care plans.

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

As social legislation increases government responsibility for the provision of medical care, this type of data is also essential to legislators and public administrators.

The present study was planned to gain an insight into problems of medical care for that portion of the population least able to provide adequate medical care for itself. It was hoped that the findings from this study would aid in the planning of a long range health program for New York State.

Since serious illness best brings the factors involved in obtaining medical care to the fore, it was decided to study the experiences of a group of individuals known to have been seriously ill. Inasmuch as the more severe phases of illness are those most likely to reach the hospital, the use of hospital records provides a source whereby it is possible to locate individuals who are known to have been seriously ill and for whom medical diagnoses have been recorded by persons competent to make medical judgments. The hospital experience provides a focus in the medical history of an individual from which it is possible to trace factors relating to the availability and adequacy of medical service together with the economic problems concerned.

The problem of the distribution of medical care has both medical and economic aspects. This is true not only from the point of view of the individual patient and his family, but also from that of the medical profession and public agencies. An opportunity to study the correlation between medical and economic data for a significant number of cases was expected to throw light on the problems in the distribution of medical care.

Patients cared for in hospital wards were selected because they were most likely to demonstrate the economic problems associated with serious illness. In addition, ward patients are of great community concern because they come from an economic group in which the incidence of illness is highest, health information most frequently lacking, and serious illness the greatest economic burden.

Communities vary in degree of organization for health and welfare needs and the adequacy and accessibility of medical services. In order to obtain conditions representative of the whole state, sample communities showing varying degrees of health and welfare organization and policy were selected for study.

Eleven general hospitals in ten different counties in New York State were selected as a source of material for study. (A preliminary analysis of their data has appeared in the 1940 *Report of the New York State Legislative Commission to Formulate a Long Range Health Program.*[2]) The counties ranged from rural to metropolitan and varied in degree of public health and public welfare organization. Medical care and public health facilities and policies were charted for these counties (see Table 1). Both voluntarily and publicly supported hospitals were included in the study. The approximate size of the sample to be selected from each hospital was determined on the basis of the population of the county and annual admissions to the hospital selected.

A nurse field worker visited each locality and copied hospital and welfare department data for each patient onto a schedule. This information included age, sex, color, civil status, occupation, length of stay in hospital, whether surgery was performed, condition on discharge, and agency responsible for hospital expense, including method of payment when patient was responsible.

Ward cases were taken in consecutive order of discharge, beginning with the most recently discharged case at the time of the field worker's visit. Only accident emergencies, psychiatric cases,

TABLE 1

Characteristics of New York State Counties and Hospitals Studied

Type of County	*Pop. per Sq. Mile*	*Beds per 1,000 Pop.*[1]	*Hosp. Control*	*Staff Organization*	*Bed Capacity*[2]	*Aver. Daily Census*[3]	*Hosp. O.P.D.*	*Welfare Policy*[4]
A — Rural	38.8	2.4	Vol.	Semi-Closed	68	37	No	Med.+Hosp.
G — Rural-Industrial	43.9	1.8	Vol.	Open	31	29	No	Med.+Hosp.
B — Rural	47.9	4.7	State-Aid	Closed	112	85	Yes	Hosp. Only
H — Rural with County Health Dept.	63.0	4.7	Vol.	Closed	133	95	No	Hosp. Only
F — Rural with Small City	83.6	12.7	Vol.	Closed	97	48	No	Med.+Hosp.
E — Rural with Small City	118.3	2.2	City	Closed	100	75	No	City Hosp.[5]
J[2] — Suburban	156.3	6.0	Vol.	Closed	61	39	Yes	Hosp. Only
J[1] — Suburban			Vol.	Closed	90,	69	Yes	Hosp. Only
I — Suburban with County Health and Welfare Depts.	175.1	4.1	Vol.	Closed	101	43	No	Med.+Hosp.
D — Urban	402.2	4.5	Vol.	Closed	593	540	Yes	Hosp. Only
C — Urban	737.3	3.9	City	Closed	1,025	862	Yes	City Hosp.[6]

[1] Beds in AMA approved general hospitals only
[2] Excluding bassinets
[3] AMA 1939 census
[4] For reimbursement on charges for hospitalized cases
[5] City operates hospital; welfare cases cared for in hospital by salaried physicians.
[6] Receives support from County Welfare Department—salaried staff physicians.

and uncompleted records were omitted from the series. A total of 2,100 schedules were filled out. The number of records copied varied from 80 from a 30 bed rural hospital, to 600 from a 1,000 bed hospital in a large city. This method of selecting cases did not provide seasonal uniformity from hospital to hospital.

With these data obtained from existing records, public health nurse investigators were sent into the field to interview the patients or responsible members of their families. The average interview consumed 40 minutes.

The nurse investigators first asked for a statement in the patient's own words of symptoms and date of onset of the illness which resulted in hospitalization. In order to secure a background concerning medical care practices prior to his illness he was asked whether he had a regular family physician and whether he had ever had a complete physical examination. The content of this examination, whether it was made in connection with life insurance, whether by a private physician, and where it took place, were called for. The patient was asked to specify the date and place of first medical attention for the illness which brought him to the hospital. When a delay was reported the patient was asked the reason.

Resort to self-medication was elicited by a question as to whether and for how long the patient doctored himself for the illness under study before securing the services of a physician. When self-medication was acknowledged, the name of the remedy used and the source of recommendation for its use were called for.

Medical care for this illness was discussed from the medical and economic points of view. The patient was asked whether and for how long he had been under the care of a private physician

prior to this hospital admission; how many office and home visits had been made; whether the physician had called a consultant; whether the patient had consulted more than one physician, and how many of his physicians had been specialists. He was also asked to specify the content of any physical examination made by a private physician and the laboratory tests performed during the pre-hospital period of this illness. In addition, he was asked how the charges for physicians' services had been met. When the pre-hospital care included clinic services, the patient was asked to identify the clinic, and the referring agency; and state how long he had been under clinic care and how many visits he had made.

Concerning the hospitalization under study, the patient was asked who referred him to the hospital, dates of application and admission to the hospital, whether he had been admitted as an emergency case, and whether he felt there had been any delay in gaining admission. The patient was questioned concerning the person or agency responsible for meeting the expense of his hospitalization, and whether he had paid for physician's services in the hospital. Hospital policy regarding the medical care of ward patients and local welfare department policies differ widely. Therefore, statements on these points by individual patients may simply reflect local practices.

The follow-up services after hospital discharge were recorded in terms of number of visits to physicians or clinics and by nursing agencies.

The economic background of the patient and his family was reviewed from the standpoint of annual cash income, and relief history extending back to 1934.

The primary emphasis in the study was on the history of each patient's disease in terms not only of medical sequence but also of individual and family welfare. No attempt was made to evaluate the quality of hospital medical care. The illness which led to this hospitalization was considered the focal point of the study.

Data for all patients were secured from the hospital and welfare records by a single graduate nurse with special training in hospital and welfare administration. Patients' interviews were completed by five graduate public health nurses, under the supervision and direc-

TABLE 2

1,607 Cases Considered by Each Type of Clinical Course by Study Area

Type of County	*All Cases*	*Recent Sudden Onset*	*Acute Attack with Previous History Same Illness*	*Long-Standing Continuous Condition*	*Obstetrical*	*Tonsillectomy* [1]
	Number	*Per cent of Total*	*Per cent of Total*	*Per cent of Total*	*Per cent of Total*	*Per cent of Total*
All Counties	1,607	31.6	12.0	30.5	16.7	9.2
A — Rural	89	42.7	22.5	14.6	16.8	3.4
G — Rural-Industrial	60	36.7	13.3	15.0	21.7	13.3
B — Rural	121	41.4	14.9	23.1	19.8	0.8
H — Rural with County Health Dept.	110	24.5	13.6	11.0	20.9	30.0
F — Rural with Small City	104	26.0	17.3	30.8	19.2	6.7
E — Rural with Small City	113	25.7	15.9	27.4	19.5	11.5
J[2] — Suburban	88	9.1	9.1	27.3	17.0	37.5
J[1] — Suburban	126	32.5	15.9	27.8	18.2	5.6
I — Suburban with County Health and Welfare Depts.	139	20.1	12.2	17.3	28.1	22.3
D — Urban	105	31.4	9.5	36.2	18.1	4.8
C — Urban	552	37.1	7.4	44.2	10.0	1.3

[1] Includes 2 cases admitted for tonsillectomy but not operated

TABLE 3

1,607 Cases Considered by Each Type of Clinical Course with Per cent Surgery by Study Area

Type of County	All Cases	Recent Sudden Onset	Acute Attack with Previous History Same Illness	Long-Standing Continuous Condition	Obstetrical
	Per cent Surgical	Per cent Surgical	Per cent Surgical	Per cent Surgical	Per cent Surgical
All Counties	43.7	38.4	61.6	48.2	2.3
A — Rural	56.2	60.5	85.0	53.9	...
G — Rural-Industrial	60.0	68.2	100.0	55.5	...
B — Rural	26.4	22.0	38.9	42.8	4.2
H — Rural with County Health Department	55.5	40.7	73.3	50.0	...
F — Rural with Small City	68.3	77.8	88.9	84.4	...
E — Rural with Small City	54.0	65.5	55.5	58.1	4.5
J[2] — Suburban	62.5	37.5	75.0	62.5	...
J[1] — Suburban	40.5	46.3	60.0	37.1	...
I — Suburban with County Health and Welfare Departments	48.2	57.1	70.6	33.3	...
D — Urban	31.4	24.2	30.0	42.1	5.3
C — Urban	33.5	23.9	41.5	44.7	5.5

TABLE 4

Per cent of Cases, by Family Economic Groups and Areas[1]

			No Income from Relief During Past Year	
	All Cases (Except T & A and Not Reported)	Any Form of Relief During Past Year	Family Cash Income Under $750	Family Cash Income $750 or Over
		Per cent of All Cases	Per cent of All Cases	Per cent of All Cases
All Counties	1,269	49.0	15.3	35.7
A — Rural	74	37.8	25.7	36.5
G — Rural-Industrial	48	27.1	16.7	56.2
B — Rural	113	31.0	30.1	38.9
H — Rural with County Health Department	74	55.4	28.4	16.2
F — Rural with Small City	88	19.3	14.8	65.9
E — Rural with Small City	91	38.5	13.2	48.3
J[2] — Suburban	54	44.4	11.1	44.5
J[1] — Suburban	114	28.1	24.5	47.4
I — Suburban with County Health and Welfare Departments	96	19.8	16.7	63.5
D — Urban	93	52.7	16.1	31.2
C — Urban	424	77.6	5.2	17.2

[1] Not included are 190 cases for which source or amount of income was not reported

TABLE 5

Per cent of Cases Delayed in Securing Medical Care by Clinical Course by Stated Reason

Clinical Course	Number of Cases	Per cent Delayed All Reasons	Did Not Realize Necessity	Per cent Delayed Economic Reason	Self-Neglect[1]	Other Reasons
All Cases (Except T & A)	1,459	54.4	50.6	29.1	11.5	8.8
Recent Sudden Onset	508	49.6	61.9	23.0	5.6	9.5
Acute Recurrent	193	44.6	40.7	34.9	16.3	8.1
Long-Standing Continuous Condition	490	55.9	44.9	39.0	8.8	7.3
Obstetrical	268	67.5	48.1	19.9	21.5	10.5

[1] Includes 4 cases in which patient stated "did not realize necessity" as a reason combined with "self-neglect."

tion of a physician. When it was known that a private physician had referred a patient to the hospital, the physician was advised by letter of the scope, purpose, and methods of the study, and informed of the names of his patients to be visited by the field nurses. Excellent coöperation was received from all the hospitals and their medical boards. Diagnosis of the illness responsible for each hospitalization was coded by a physician, and all problems relating to clinical course were subjected to medical review. Before completing a final statistical analysis, each case was reviewed and edited as a unit. Punch card tabulation was utilized.

The following significant observations were presented for 1,607 cases*:

The illnesses which brought these patients to the hospital have been classified into three broad categories according to clinical type. In addition, obstetrical and tonsillectomy cases which present certain special characteristics have been analyzed as separate groups. Table 2 shows the proportion of cases in each of these groups in the entire study and by individual hospitals. It is notable that the rural hospitals cared for a high proportion of cases with recent onsets and for acute attacks of recurrent conditions, indicating their greater use for emergency situations as compared to the hospitals in more urban communities. Table 3 shows the surgical rate for each type of case for each hospital in the study. In general, the surgical rates were considerably lower for the hospitals of large urban centers.

An index of the economic status of the patients considered in this study may be gained from an analysis according to whether or not any form of public assistance was received *within the year preceding interview*. Among all cases (except tonsillectomies and those for which data were not supplied), it may be seen from Table 4 that nearly one-half had received relief. Those who received no relief during this period have been analyzed according to whether the family annual cash income was under or over $750. The breakdown of these data by hospitals shows a high degree of variation from community to community, and an unusually high proportion of relief recipients in the large urban centers and also in one rural county. Thus, it may be seen that the blanket figure of 49 per cent relief recipients conceals a variety of local situations. However, an analysis by economic status, based on relief support *at the time of hospitalization*, showed a considerably lower proportion in the relief group. This suggests that a large group of the ward population is made up of families on the economic fringe between relief and self-support. The general economic level of a community also affects the proportion of the ward population on relief. The type of control of the hospital under study, as well as the existence of government supported hospitals in the vicinity, is another factor on which economic distribution of ward population depends.

Reasons stated by the patients for delay in securing medical care for the conditions which necessitated their hospitalization have been analyzed according to clinical course in Table 5. Fifty-four per cent of all cases (tonsillectomies excepted) reported delays. The highest proportion of delays, 67.5 per cent, was reported by obstetrical patients. This high figure is the result of the application of strict criteria in defining delay in obstetrical cases. Any patient not under medical supervision by the end of the third month of pregnancy was considered a delayed case. The predominant reason brought forward in all types of cases was failure to realize the necessity for medical atten-

* The nurses were able to complete 1,784 home interviews covering 85 per cent of the 2,099 ward patients selected. One hundred and seventy-seven cases are omitted from this analysis because they were considered unsuitable for statistical handling.

TABLE 6

Per cent of Cases Seen by Clinics and by Physicians in Pre-Hospital Period and Per cent of Cases for Whom Public Welfare Agencies Paid Physicians' Fees

Type of County	All Cases (Except T & A)[1]	Per cent Seen by Clinic	Seen by Physician: per cent	Seen by Physician: M.D. Per cent Paid by Welfare Agency[2]
All Counties	1,459	24.5	80.8	29.2
A — Rural	86	...	100.0	23.3
G — Rural-Industrial	52	...	100.0	28.8
B — Rural	120	5.0	95.0	29.8
H — Rural with County Health Dept.	77	18.2	80.5	40.3
F — Rural with Small City	97	2.1	99.0	15.6
E — Rural with Small City	100	8.0	98.0	30.6
J[2] — Suburban	55	25.5	83.6	28.3
J[1] — Suburban	119	8.4	89.1	17.0
I — Suburban with County Health and Welfare Departments	108	0.9	97.2	21.9
D — Urban	100	55.0	57.0	17.5
C — Urban	545	45.3	65.5	39.5

[1] Includes 142 cases seen by both physician and clinic and 65 cases seen first at time of hospitalization
[2] Includes public physicians paid by welfare departments

tion. It is noteworthy that the initial attacks of acute conditions accounted for the highest proportion of these, while recurrent attacks and long-standing continuous conditions appear to have educated the patient to some extent to the necessity for medical attention. In the latter types of case, the economic factor played a more prominent rôle.

Medical care received in the pre-hospital period for the illness which necessitated hospitalization was studied as shown in Table 6—24.5 per cent of the cases reported care by clinics. An analysis of clinic utilization according to economic status of the ward patients showed that the existence of clinic facilities rather than family income conditioned clinic attendance.

The proportion of patients cared for by private physicians is shown in Table 6. It will be noted that in many instances patients must have utilized both clinics and physicians' services. The proportion of physicians' services paid

TABLE 7

Per cent of Cases Seen by Physicians in Pre-Hospital Period, by Family Economic Groups and Areas[1]

Type of County	Any Form of Relief During Past Year: Seen by Physician: Per cent	No Income from Relief During Past Year: Family Cash Income Under $750: Seen by Physician: Per cent	No Income from Relief During Past Year: Family Cash Income $750 or Over: Seen by Physician: Per cent
All Counties	71.2	85.6	90.5
A — Rural	100.0	100.0	100.0
G — Rural-Industrial	100.0	100.0	100.0
B — Rural	97.1	94.1	95.5
H — Rural with County Health Department	82.9	66.7	100.0
F — Rural with Small City	100.0	100.0	100.0
E — Rural with Small City	97.1	100.0	100.0
J[2] — Suburban	87.5	83.3	79.2
J[1] — Suburban	90.6	78.6	92.7
I — Suburban with County Health and Welfare Depts.	100.0	100.0	96.7
D — Urban	55.1	66.7	58.6
C — Urban	56.8	68.2	75.3

[1] Not included are 190 cases for which source or amount of income was not reported

TABLE 8

Per cent of Cases, by Family Economic Groups and Areas, with Per cent of Those Seen by Physicians in Pre-Hospital Period and Paid for by Public Welfare Agencies[1]

Type of County	Any Form of Relief During Past Year	No Income from Relief During Past Year	
		Family Cash Income Under $750	Family Cash Income $750 or Over
	Seen by Physician	Seen by Physician	
	Per cent Welfare Paid Physician[2]	Per cent Welfare Paid Physician[2]	Per cent Welfare Paid Physician[2]
All Counties	62.8	10.2	7.8
A — Rural	64.3	5.3	...
G — Rural-Industrial	76.9	25.0	7.4
B — Rural	64.7	12.5	19.0
H — Rural with County Health Department	61.8	7.1	25.0
F — Rural with Small City	64.7	7.7	3.4
E — Rural with Small City	85.3	...	2.3
J[2] — Suburban	57.1	...	5.3
J[1] — Suburban	51.7	...	6.0
I — Suburban with County Health and Welfare Depts.	94.7	18.8	1.7
D — Urban	33.3	10.0	...
C — Urban	60.4	26.7	20.0

[1] Not included are 190 cases for which source or amount of income was not reported
[2] Includes public physicians paid by welfare departments

for by welfare agencies is also shown and its variability indicates differences in local welfare policy. Tables 7 and 8 analyze care by and welfare payment of physicians by economic status of patients. It may be seen that the variation from community to community is not entirely dependent upon the economic distribution of the ward patient sample but is also determined by local welfare policies.

Nearly 50 per cent of the hospitalizations studied were paid for from Welfare Department funds as shown in Table 9. The two densely populated urban areas contributed the highest proportion of welfare paid cases. It should be noted that urban hospital D is a municipal hospital so that all hospitalizations not paid for by patients were considered welfare responsibilities. An attempt was made to find out whether patients had

TABLE 9

Per cent of Hospitalization Paid for by Public Welfare Agencies and Per cent of Patients Responsible for the Payment of Physicians' Services in Hospital, by Study Areas

Type of County	All Cases	Per cent Cases Hosp. Paid by Welf. Dept.[1]	Per cent Cases Responsible for M.D. Fees in Hosp.
All Counties	1,607	48.6	33.7
A — Rural	89	32.6	62.9
G — Rural-Industrial	60	30.0	70.0
B — Rural	121	54.5	46.3
H — Rural with County Health Department	110	50.0	1.8
F — Rural with Small City	104	17.3	79.8
E — Rural with Small City	113	29.2	70.8
J[2] — Suburban	88	30.7	33.0
J[1] — Suburban	126	26.2	66.7
I — Suburban with County Health and Welfare Depts.	139	27.3	68.3
D — Urban	105	82.9	5.7
C — Urban	552	68.3	1.4

[1] Includes 31 cases in which patient shared hospital expense with welfare department

been responsible for payment for physicians' ward services in the hospital, as shown in Table 9. Hospital staff organization is revealed in the findings.

Evidence of the burden which many of the patients in the lower and intermediate income groups experience in attempting to pay medical and hospital bills was brought out by interview but is not shown by statistical analysis. A number of patients, especially in rural areas, stated that they were still paying small amounts toward the medical expense of previous illnesses at the time they were taken sick with the illness under study.

SUMMARY

A few of the factors involved in the distribution of medical care have been statistically analyzed and presented. This new application of epidemiological method shows the complexity of the factors requiring analysis in order to arrive at valid conclusions concerning the distribution of medical care and the dangers inherent in reaching conclusions based on too superficial an approach to the problem.

REFERENCES

1. Greenwood, Major. *Epidemics and Crowd Diseases.* Macmillan, 1935, p. 15.
2. *Medical Care in N. Y. State.* Leg. Doc. (1940) No. 91.

In this time of national emergency your country needs your help. Buy Defense Savings Bonds and Stamps regularly.

The Treasury Department or the Federal Reserve Banks will hold your Defense Savings Bonds for safekeeping free of charge.

—Buy Defense Bonds and Stamps—

Human Equine Encephalomyelitis in Kern County, California 1938, 1939, and 1940*

WILLIAM C. BUSS, M.D., C.P.H., AND BEATRICE F. HOWITT

Kern County Health Department, Bakersfield, Calif.; and the George Williams Hooper Foundation, University of California Medical Center, San Francisco, Calif.

IN addition to the known neurotropic virus diseases that have been responsible for much human and animal sickness, medical science has recently added equine encephalomyelitis to those affecting man. In 1930, Meyer, Haring, and Howitt [1] first isolated a virus from the brain tissue of infected horses in California. Meyer [2] had suspected the occurrence of human encephalomyelitis in 1932, when the disease was reported in three men working with horses having encephalomyelitis. No virus, however, was recovered. In 1938 Fothergill, Dingle, Farber, and Connerly [3] reported obtaining the eastern strain of the equine virus from human cases in Massachusetts, while in the same year the relationship of the western strain to man was first established by Howitt [4] in California. Meyer [5] had suggested that, in the lower San Joaquin Valley, cases of encephalitis had been inaccurately reported as poliomyelitis or had been missed. Subsequently, in so far as could be determined by serum neutralization tests as reported by Howitt [6] in 1939 and by diagnostic information from other sources, a different viewpoint was obtained concerning neurotropic virus diseases in Kern County, Calif. Although poliomyelitis predominated, an unexpectedy high proportion of the cases proved to be of the equine encephalomyelitic type, and a small number of the St. Louis type of encephalitis, as demonstrated by means of the serum neutralization tests. A few remained not specifically diagnosed. Thus it was shown that more than one variety of neurotropic virus disease had been prevalent in Kern County.

Seventy-one patients in 1938, 160 in 1939, and 85 in 1940 were admitted to the Kern County General Hospital with a tentative diagnosis of neurotropic virus disease. A few cases were quarantined at home during each of the three years. On the basis of the neutralization tests, the epidemiological histories and the clinical and laboratory findings, 116 cases were segregated as equine encephalomyelitis. There were 22 cases in 1938, 46 in 1939, and 48 in 1940. The recovery of the western equine virus from the brains of 2 patients confirmed the presence of human cases in Kern County.

The neutralization tests employed for the differential diagnosis of the cases were performed according to methods previously described.[6] The strain of western equine virus isolated in Cali-

* Aided by a grant from the National Foundation for Infantile Paralysis, Inc.

fornia in 1938[4] was used throughout the studies, while the St. Louis virus was one originally sent by Dr. L. T. Webster of the Rockefeller Institute. Whenever material could be obtained, 10 per cent suspensions of brain or cord from autopsy cases were inoculated into mice, guinea pigs, and a monkey. Upon recovery of a virus from one or all of these animals, further serological and immunological tests were made to determine the type.

The following report deals with a neurotropic virus study in Kern County, Calif., conducted by the staff members of the Kern County General Hospital and the Kern County Department of Health in the years of 1938, 1939, and 1940, in collaboration with Miss Howitt.

EPIDEMIOLOGY

Unsolved problems concerning the epidemiology of equine encephalomyelitis are numerous, even though further knowledge of the disease has accumulated rapidly. In Kern County, the summer and fall occurrence parallels the seasonal incidence shown in other sections of the country. The reoccurrence of cases in successive years shows a spotty distribution in rural areas. In the farming districts the horse population has been repeatedly exposed to the virus; there are irrigation ditches or other breeding places for mosquitoes that might be incriminated as insect vectors, and there are the human cases. There was no epidemiological evidence to indicate that the virus of equine encephalomyelitis was carried through milk, water, or food. It seemed quite unlikely that secondary cases occurred by direct or indirect contact. For these reasons and because of the limitation of the disease to the warm season of the year, the possibility of its spread by an insect vector, particularly the mosquito, was seriously considered. Evidence to corroborate this theory can be seen in the following typical histories taken from the group of human cases of encephalomyelitis of 1939.

Case 13—S.C.L., male, 5 months of age, was admitted to the Kern County General Hospital on July 15, 1939, because of irritability, stiffness of the neck, convulsions, and fever. Onset of illness was July 8, 1939. Physical findings were normal except for stiff neck, bulging anterior fontanel, and spasticity of the extremities. X-ray of the chest was negative. Spinal fluid showed increased pressure, ground glass appearance, 115 cells, 56 per cent polymorphonuclears and 44 per cent lymphocytes, globulin 4+. The child made a complete recovery. The neutralization test was positive for the western equine virus. This child was from the Buttonwillow district where there had been horses sick with equine encephalomyelitis within a half mile of the home. The child was covered with old and new insect bites which the parents stated were from mosquitoes.

Case 19—G.G., 7 weeks old Mexican female, a neighbor of Case 13, became ill July 28, 1939, and was admitted to the Kern County General Hospital on August 1, 1939, because of chills, fever, convulsions, and neck stiffness. These findings were noted in the hospital stay as well as cyanosis, bulging fontanels, irritability, and difficulty in taking food. Spinal fluid examination on August 5, showed 36 cells, 10 per cent polymorphonuclears and 90 per cent lymphocytes, with 4+ globulin. The child died on August 9, 1939. The gross post-mortem findings were negative. Microscopic pathology was consistent with encephalomyelitis as the anatomical diagnosis. The serum neutralization test was also positive for equine encephalomyelitis. The child had been covered with old and new mosquito bites.

Case 26—C.F., a white male, age 5½ weeks, became ill on August 14, 1939, and was admitted to the Kern County General Hospital on August 19, 1939, because of fever, vomiting, convulsions, neck stiffness, and head cold. Physical findings were normal except for stiffness of the neck, spasticity of the extremities, and slight bulging of the fontanels. Spinal fluid examination of August 20, 1939, showed increased pressure, ground glass appearance, 938 cells, 50 per cent polymorphonuclears and 50 per cent lymphocytes, with 4+ globulin. The serum neutralization test was positive for equine encephalomyelitis. This child had been bitten frequently by mosquitoes, and made a complete recovery.

Case 30—R.B., white male, 30 years of age, farm laborer, resident of McFarland for 2

years. Onset of illness was on August 23, 1939, at which time he had drowsiness, occipital headache, stiffness of the neck, chills, fever, loss of appetite, nausea and vomiting, and weakness of the left arm and left shoulder. Delirium and then unconsciousness began about August 29. A flat chest plate taken August 29, 1939, showed a bronchopneumonia of both upper lobes that cleared uneventfully. A complete recovery was made after 3 months of physical therapy treatment for the left arm and shoulder.

Prior to his illness this man had been working with a sick horse which the veterinarian diagnosed as having equine encephalomyelitis. Neutralization tests on the sera of the patient and the unvaccinated horse were positive for this disease. The man had been sleeping on a haystack near the horse and had been bitten repeatedly by mosquitoes.

CLINICAL PICTURE AND DIFFERENTIAL DIAGNOSIS

Acute anterior poliomyelitis and equine encephalomyelitis were given the most consideration among the neuroptropic virus diseases seen in Kern County during 1938, 1939, and 1940. The diagnosis was clear-cut only in the instances of true paralytic poliomyelitis and in the age group under 1 year for the equine disease. The symptoms and clinical findings for human equine encephalomyelitis were particularly characteristic for cases under 1 year of age. Fever was common with temperatures to 107° F. in fatal and non-fatal cases; convulsions with muscle twitchings and spasms were observed; cyanosis, irritability, drowsiness, tremors, vomiting, muscle weakness, and a residual spastic type of paralysis were noteworthy. The spinal fluid findings usually showed a ground glass appearance with increased globulin to 4+, slight increase in pressure, and white cell counts of 50 to 1,500. The differential white cell count seemed to vary considerably. In 1938, 52.6 per cent of the cases showed a predominance of lymphocytes over polymorphonuclears; in 1939, there were 78.5 per cent, while in 1940, the ratio had changed to 54.7 per cent of the cases with more lymphocytes to 45.3 per cent with more polymorphonuclears.

Because of the high incidence of tuberculosis and coccidioidomycosis in Kern County, Mantoux and coccidiodin skin tests were done routinely on every case in this series. Those having positive reactions to either skin test and considered as possibly having pulmonary forms of either of these diseases were given routine chest x-ray examinations.

The differential diagnosis of the neurotropic virus disease was frequently difficult, so that positive neutralization tests were most helpful. The atypical cases of equine encephalomyelitis and cases of non-paralytic poliomyelitis, particularly in the older age group, caused most concern in differentiation.

In the series of cases studied in Kern County in 1938, 1939, and 1940, the following diseases were considered in the differential diagnosis: the St. Louis encephalitis, lymphocytic chorio-meningitis, infectious mononucleosis, tubercular pachymeningitis associated with generalized tuberculosis of childhood, coccidioidal meningitis, purulent types of meningitis, cerebral accident, luetic meningitis, postvaccinal encephalitis,

TABLE 1

Summary of Neutralization Tests for Equine Encephalomyelitis Among Neurotropic Virus Cases

	Cases of Encephalomyelitic Infection				*Cases of Poliomyelitic Infection*			
Year	*No. of Cases*	*No. Tested*	*No. Positive*	*Per cent Positive*	*No. of Cases*	*No. Tested*	*No. Positive*	*Per cent Positive*
1938	22	19	15	78.9	27	2	0	0
1939	46	46	42	91.3	73	65	5	7.6
1940	48	47	40	85.1	18	15	0	0
Total	116	112	97	86.6	118	82	5	6.0

encephalitis following measles, and one case of transverse myelitis.

Neutralization tests against the St. Louis encephalitic virus were done on all sera for the first 2 years but were discontinued during 1940. In 1938, 3 sera out of 19 (15.7 per cent) were positive to this virus alone, while in 1939 the numbers had dropped to 4 out of 46 (8.6 per cent). Four sera in 1938, and 5 in 1939 gave positive tests to both the St. Louis and the equine viruses.

Table 1 summarizes the results of the neutralization tests against the equine virus on sera of patients showing symptoms of either encephalitis or poliomyelitis during 1938, 1939, and 1940. Of 112 sera from cases diagnosed as encephalitis, 97 (86.6 per cent) were positive and of 82 sera from cases of poliomyelitis, only 5 (6 per cent) neutralized the equine virus.

During this 3 year period blood was obtained from different groups of so-called normal individuals, mainly relatives or friends who had been in contact with frank cases of equine encephalomyelitis. Certain of these people had manifested symptoms suggestive of a mild attack of a neurotropic virus disease and were tabulated as "sick contacts" as shown in Tables 2 and 3.

TABLE 2

Summary of Neutralization Tests for Equine Encephalomyelitis on Sera of Contacts

	Sick Contacts (Mild Cases of Infection)			Well Contacts		
Year	*No. Tested*	*No. Positive*	*Per cent Positive*	*No. Tested*	*No. Positive*	*Per cent Positive*
1938	6	6	100	8	0	0
1939	17	7	41.1	14	2±	14.3
					3±	
1940	18	16	88.9	60	1+	6.7
					5±	
					1+	
Total	41	29	70.7	82		7.3

From a total of 82 well contacts, only 6 sera (7.3 per cent) showed evidence of neutralizing ability. Five of these were weakly positive and only 1 strongly positive. The latter serum came from a man of 29 years who was the father of an infant showing typical symptoms of the disease. The serum of the mother was negative. In fact, it was interesting that of 9 sets of both parents and 5 single parents tested for antibodies to the equine virus, only this man showed a positive test. Most of these parents had infants under 1 year of age who manifested typical symptoms of equine encephalomyelitis and gave positive serum neutralization tests. Their antibodies were therefore not acquired from the mothers.

The individuals listed as sick con-

TABLE 3

Neutralization Tests Among Contacts to Cases of Equine Encephalomyelitis in 1940 According to Age *

	No. of People Tested	*Under 1 Year*		*1–9 Years*		*10–19 Years*		*20 Years and Over*	
		0	+	*0*	+	*0*	+	*0*	+
Sick Contacts	18	0	0	2 (11.1%)	3 (16.6%)	0	7 (38.8%)	0	6 (33.3%)
Well Contacts	60	0	0	8 (13.3%)	1 (1.6%)	15 (25.0%)	1 (1.6%)	33 (55.0%)	2 (3.3%)

* *0* = No neutralization
\+ = Neutralized

tacts should probably have been placed with the group of real cases, since they all showed a mild or abortive attack of some illness, although few of them were hospitalized. However, because they were all either friends or relatives of someone having a more severe form of the equine disease, they were put in a separate group. During 1938, 1939, and 1940, sera from 41 such cases were tested for neutralizing ability and 29 (70.7 per cent) were positive to the virus of equine encephalomyelitis. The figures for 1940 are probably more reliable than for the other 2 years and also included the largest number of sera tested from apparently healthy individuals. That so many of the sick contacts were really mild cases of the same disease, affecting one or more other members in a family, is suggestive of a common source of infection or exposure to similar environmental conditions. That many of these people lived on farms, in labor camps, in box cars, or in small towns with an abundance of mosquitoes in common lends itself to this idea. Of one group of 9 children and adults tested from a migratory camp, 1 had the typical disease, 1 an abortive form with positive antibodies in the serum, while 1 other remained well but gave a weakly positive serum neutralization test. All 3 children were under 5 years of age.

Table 3 summarizes the age distribution for both the sick and well contacts of 1940 and shows the number having neutralizing antibodies for the equine virus in each period.

AGE AND SEX

Among the cases diagnosed as encephalitis in 1938, the range in age varied from 3 weeks to 41 years with 5 (22.7 per cent) of the group under 1 year of age and 50 per cent under 10 years. There were 10 females and 12 males (Table 4) with a mortality of 1 (4.5 per cent).

Among the poliomyelitic cases for the same year, the ages varied from 17½ months to 66 years, with none under 1 year. However, there were 12 cases (44 per cent) under 10 years of age. The youngest of 17½ months had negative neutralization tests for both the equine and the St. Louis viruses. There were 8 females, 19 males, and a mortality of 6 (22.2 per cent).

In 1939 the encephalitic cases ranged in age from 6 weeks to 62 years with 27 (58.6 per cent) under 10 years. Among the group of 8 cases (17.3 per cent) under 1 year of age, the diagnosis was substantiated both by clinical symptoms and the presence of neutralizing antibodies against the equine virus. There were 15 females and 31 males with a mortality of 3 (6.5 per cent). Two deaths occurred among those under 1 year of age.

For the poliomyelitic patients of 1939, the age varied from 10 months to 39 years, with 38 (52 per cent) of the 73 cases under 10 years. There were 27 females and 48 males and a mortality of 3 (4.1 per cent).

In 1940 the cases of encephalitis varied in age from 3 weeks to 63 years, with 16 (33.3 per cent) under 1 year. Twenty-nine (60.4 per cent) were in the group under 10 years. There were 15 females and 33 males with 1 (14.5 per cent) mortality. Only 18 cases of poliomyelitis occurred in 1940 (Table 4).

One may observe especially in Table 4, (1) that males predominated over females in both groups diagnosed either as poliomyelitis or encephalitis, with twice as many males in the years 1938 and 1939 for the latter disease, and (2) the largest percentage of cases diagnosed as encephalomyelitis in all 3 years occurred in the group under 10 years. There were over twice as many cases among the latter group as among adults 20 years or over. The

TABLE 4

Age and Sex Distribution and Mortality Rate for Neurotropic Virus Cases *

Year	Disease	Sex		Total No. of Cases	Under 1 Yr.	1–9 Yrs.	10–19 Yrs.	20 and Over	Mortality
		Male	Female						
1938	Polio.	19 (70.4%)	8 (29.6%)	27	—	12 (44.4%)	4 (14.8%)	11 (40.7%)	6 (22.2%)
	E. E.	12 (54.5%)	10 (45.5%)	22	5 (22.7%)	6 (27.2%)	4 (18.1%)	7 (31.8%)	1 (4.5%)
1939	Polio.	46 (63.0%)	27 (37.0%)	73	1 (1.3%)	37 (50.6%)	19 (26.0%)	16 (21.9%)	3 (4.1%)
	E. E.	31 (67.3%)	15 (32.7%)	46	8 (17.3%)	19 (41.3%)	7 (15.2%)	12 (26.0%)	3 (6.5%)
1940	Polio.	10 (55.5%)	8 (44.5%)	18	—	7 (38.8%)	4 (22.2%)	7 (38.8%)	2 (11.1%)
	E. E.	33 (69.1%)	15 (30.9%)	48	16 (33.3%)	13 (27.0%)	7 (14.5%)	12 (25.0%)	7 (14.5%)

* Polio = Poliomyelitis
E. E. = Equine encephalomyelitis

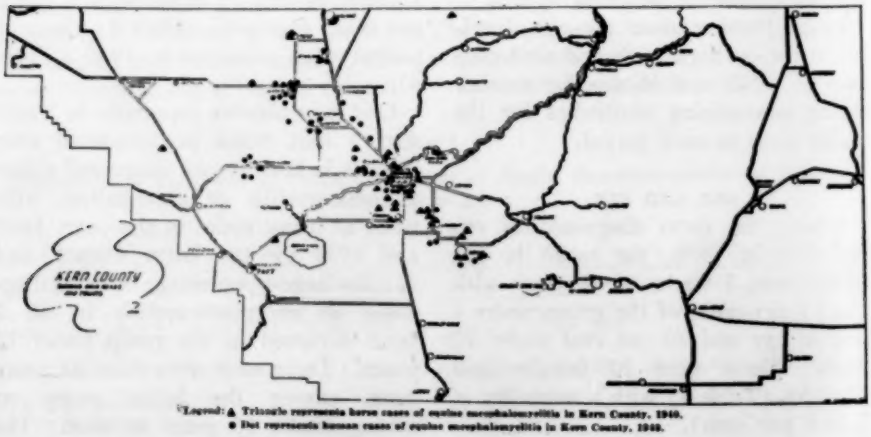
percentage is also high among infants under 1 year.

RACE AND GEOGRAPHICAL DISTRIBUTION

During the 3 years there was nothing significant about the racial distribution of the patients diagnosed as either poliomyelitis or encephalomyelitis. In 1939 there were 4 Negroes and 2 Mexicans among the cases of poliomyelitis and 4 Negroes, 1 Mexican, and 1 Japanese among those of encephalomyelitis. In 1940 there was 1 Negro.

The geographical distribution among the encephalitic groups occurred in definite endemic localities. In 1939 there were 6 cases in the Buttonwillow district. Three of them were 5 months old or under, and all of them were under 5 years of age. This age group and the locality seem significant because of the presence of numerous mosquitoes and of many cases of encephalomyelitis reported among the horses. There were 11 human cases in the Wasco-Shafter area, 6 around Delano-McFarland Pond, and 3 in the Arvin-Lamont-Weedpatch districts. The remainder of the 46 patients were from rural localities outside of Bakersfield. In 1940 the same areas contributed most of the cases of human equine encephalomyelitis as shown in the map, in which a comparison is made of the distribution of human and equine cases.

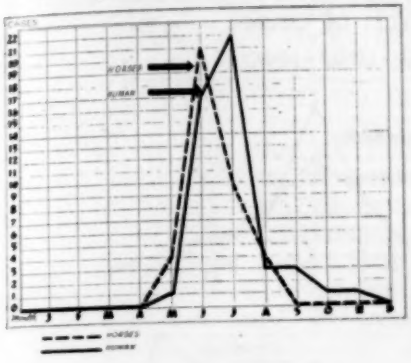
The distribution of poliomyelitis was



Legend: ▲ Triangle represents horse cases of equine encephalomyelitis in Kern County, 1940.
● Dot represents human cases of equine encephalomyelitis in Kern County, 1940.

CHART 1

Cases of Equine Encephalomyelitis in Kern County by month of onset in humans and in horses · 1940 ·



noticeably in the more urban districts, with a few cases in the western end of the county.

Of most significance in the geographical distribution was the apparent absence of neurotropic virus diseases in the eastern end of the county. No encephalomyelitis was reported from the dry desert portions lacking in water, while all the known cases were found in the farming regions where water was plentiful. It is noteworthy that for each season the human cases of this disease have occurred in the same endemic localities where there have been both many mosquitoes and cases among the horses.

From the incomplete reports of Kern County veterinarians, approximately 40 cases of encephalomyelitis occurred among the horses in 1938, with fewer numbers in 1939, and again 40 in 1940. Chart 1 compares the incidence of human and equine disease for 1940. It has been exceedingly difficult to correlate specifically the human with equine cases in certain areas, although in the Wasco district in 1940 5 human cases were found within one to two miles of 2 acute cases among horses.

SEASONAL INCIDENCE

There is a definite seasonal incidence of neurotropic virus diseases in Kern County. In 1938 the number of cases diagnosed as poliomyelitis reached a peak in August, as did also those of the human equine disease as shown in Chart 2. In 1939 there were reported 119 cases of neurotropic virus disease. Compared with the expected number of cases of poliomyelitis based on the mean of reported incidence in 1934–1938, there seemed to be a minor epidemic trend in 1939, but when the cases of poliomyelitis were separated from those of equine encephalomyelitis there was no evidence of an epidemic. The peak of encephalomyelitis in 1939 was in August, and that of poliomyelitis in November. This unexpectedly late incidence for the latter disease had been noted also for 1934 and 1935 when the summer heat was prolonged into the autumn months.

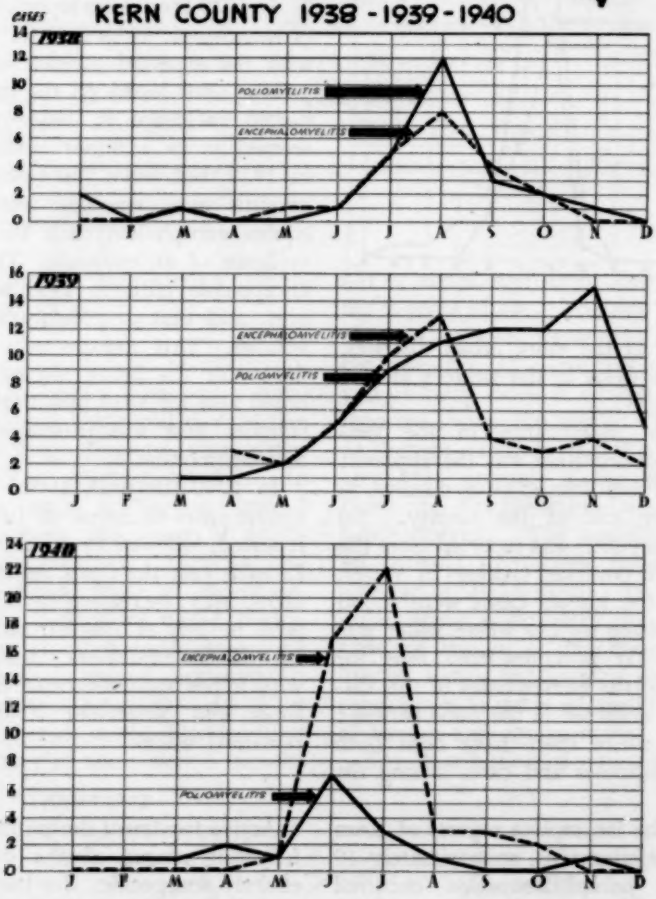
In 1940 the peak of the 48 human equine cases occurred in July, with 22 reported, followed by an abrupt decline. In each year the cases began to appear about May, increasing each month to a peak in July or August, and then falling off in September, but continuing with a few sporadic cases through October and November if the weather remained warm.

TREATMENT

Active treatment during the acute and following stages of the diseases was entirely nonspecific. For the severe convulsions a variety of sedatives were used, the most beneficial being chloral hydrate by rectal instillation and soluble phenobarbital given intravenously in doses of 1½ to 2 grains. During 1938 sulfanilamide was given routinely, either parenterally or by gavage, during the period of illness. Later its use was limited to the first few days of illness until the possibility of bacterial meningitis had been excluded. During the comatose state parenteral fluids and gavage feedings were administered ac-

CHART II

Graphs comparing monthly incidence of Equine Encephalomyelitis and Poliomyelitis..... By month of onset..



cording to necessity. Small transfusions and intramuscular blood were given routinely. A thorough muscle check was given in the physiotherapy department to those cases recovering at the end of 21 days, and treatment instituted when needed. Later spasticity or weakness of the extremities was treated by physiotherapy or application of casts. A periodic check followed discharge from the hospital in every case with apparent normal recovery.

DISCUSSION

It is evident that the disease of equine encephalomyelitis has been present among the human population of Kern County, Calif., for a number of years, as demonstrated by finding neutralizing substances in the sera of a few individuals with onset of symptoms in 1934 or 1935.[6]

While the results of this study are based largely upon the outcome of the neutralization tests, yet the presence of

the equine virus was proved in 1940 by recovery of this western strain from the brain material of 2 patients, one an infant of 7 months (F.J.M.), and the other an adult of 63 years (T.F.). The disease in the infant ran a typical course with fever, irritability, retraction of the head, lethargy, tremors and convulsions, the child becoming comatose and dying in 5 days after the onset. The adult showed headache, drowsiness, fever, coma, and death in 12 days after the onset of the disease. Suspensions of the brain stem of the 2 cases yielded the virus of western equine encephalomyelitis when inoculated into mice, guinea pigs, and monkeys.

Although the eastern virus of equine encephalomyelitis was the first to be reported in man,[3, 7] it is apparent that the western strain has been infecting people over a larger area of the United States, as shown by reports based mainly on the results of serum neutralization tests or of clinical findings alone.[8-12] Fulton, however, has reported obtaining the virus from human brain and serum in Canada.[13] That there is more of this human disease along the Pacific slope than surmised is evidenced by reports from the State of Washington where cases have been found in the Yakima Valley.[14] In California the disease in man has become prevalent since 1937,[6] a total of 43 cases having been reported in the literature so far; 3 by Meyer,[2] 32 by Howitt,[6] 2 by Davis,[15] and 6 by Cope and Maytum.[16] These cases of human equine encephalomyelitis have occurred mainly in the two large central California valleys, with Kern County as a principle focus at the lower end. Since 97 encephalitic cases in this county have given positive neutralization tests against the western equine virus during the past 3 years, the evidence is strongly suggestive of a permanent endemic area unless some control measures are instituted.

SUMMARY

It has been found that the western virus of equine encephalomyelitis is endemic among the human as well as the horse population of Kern County, Calif. Although cases of poliomyelitis predominated among those having neurotropic virus diseases, by means of the serum neutralization test it has been shown that for the years 1938, 1939, and 1940, respectively, of 112 encephalitic cases that were tested, the sera of 97 (86.6 per cent) were positive for the virus of equine encephalomyelitis. Of 82 cases diagnosed as poliomyelitis, 5 (6 per cent) were also positive for the equine virus.

The sera of 6 out of 82 (7.3 per cent) well contacts and those of 29 of 41 (70.7 per cent) sick contacts (mild cases of infection) had neutralizing antibodies to the same virus.

The largest percentage of cases diagnosed as having equine encephalomyelitis during all 3 years came in the group under 10 years of age, with a noticeable number below 1 year. Males predominated over females among the encephalitic patients as well as among those having poliomyelitis.

The western virus of equine encephalomyelitis was recovered from the brain material of 1 infant and 1 adult during 1940.

TABLE 5

Sex Distribution of Neurotropic Virus Cases

	Equine Encephalomyelitis			*Poliomyelitis*		
Year	*No. of Cases*	*Male*	*Female*	*No. of Cases*	*Male*	*Female*
1938	22	12 (54.5%)	10 (45.5%)	27	19 (70.4%)	8 (29.6%
1939	46	31 (67.3%)	15 (32.7%)	73	46 (63%)	27 (37%)
1940	48	33 (69.1%)	15 (30.9%)	18	10 (55.5%)	8 (44.5%)

The cases of human equine encephalomyelitis in Kern County began about May, increasing to a peak in August for the years 1938 and 1939, and in July for 1940, dropping off abruptly, with only a few through November. All cases were centered in the farming and irrigated areas in the central and western portions of the county, with none reported from the mountains or the eastern desert districts.

ACKNOWLEDGMENTS

The authors wish to express thanks to Dr. Joe Smith, the Kern County Director of Health, for sponsoring and encouraging the survey within the county; to Dr. K. F. Meyer, Director of the Hooper Foundation, for his constructive criticism, and to Jack Wiseman, artist of the Kern County Health Department, for his excellent presentation of the charts.

REFERENCES

1. Meyer, K. F., Haring, C. M., and Howitt, B. F. The Etiology of Epizootic Encephalomyelitis of Horses in the San Joaquin Valley, 1930. *Science*, 74:227, 1931.

2. Meyer, K. F. A Summary of Recent Studies on Equine Encephalomyelitis. *Ann. Int. Med.*, 6:645, 1932.

3. Fothergill, LeR., Dingle, J. H., Farber, S., and Connerly, M. L. Human Encephalitis Caused by the Eastern Variety of Equine Encephalomyelitis. *New England J. Med.*, 219:411, 1938.

Webster, L. T., and Wright, F. H. Recovery of the Eastern Equine Encephalomyelitis Virus from Brain Tissue of Human Cases of Encephalitis in Massachusetts. *Science*, 88:305, 1938.

4. Howitt, B. F. Recovery of the Virus of Equine Encephalomyelitis from the Brain of a Child. *Science*, 88:455, 1938.

5. Meyer, K. F. Personal communication.

6. Howitt, B. F. Viruses of Equine and of St. Louis Encephalitis in Relationship to Human Infections in California, 1937–38. *A.J.P.H.*, 29:1083., 1939.

7. Feemster, R. F. Outbreak of Encephalitis in Man Due to the Eastern Virus of Equine Encephalomyelitis. *A.J.P.H.*, 28:1403, 1938.

8. Wesselhoeft, C., Smith. E. C., and Branch, C. F. Human Encephalitis; Eight Fatal Cases with Four Due to the Virus of Equine Encephalomyelitis. *J.A.M.A.*, 111:1735, 1938.

9. Ecklund, C. M., and Blumstein, A. The Relation of Human Encephalitis to Encephalitis in Horses. *J.A.M.A.*, 111:1734, 1938.

10. Breslich, P. J., Rowe, P. H., and Lehman, W. L. Epidemic Encephalitis in North Dakota. *J.A.M.A.*, 113:1722, 1939.

11. Larimer, R. N., and Wiesser, E. G. Human Equine Encephalomyelitis. *J. Iowa M. Soc.*, 29, 287, 1939.

12. Platou, R. V. Equine Encephalomyelitis in Infancy. *Am. J. Dis. Child.*, 60:1155, 1940.

13. Fulton, J. S. Relation of Equine Encephalomyelitis to the Epidemic of Human Encephalitis in Saskatchewan in 1938. *Canad. Pub. Health J.*, 32:6, 1941.

14. Hammon, W. McD., and Howitt, B. F. Unpublished report.

15. Davis, J. H. Equine Encephalomyelitis (western type) in Children. *J. Pediat.*, 16:591, 1940.

16. Cope, J. H., and Maytum, H. Equine Encephalomyelitis. *California & West. Med.*, 53:82, 1940.

Epidemiology and Laboratory Diagnosis of Infectious Jaundice (Weil's Disease)*

JOSEPH G. MOLNER, M.D., M.P.H., F.A.P.H.A., AND
JOSEPH A. KASPER, M.D., F.A.P.H.A.

Director of School Health Service; and Director of Public Health Laboratories, Detroit Department of Health, Detroit, Mich.

Epidemiology

THE clinical condition known as jaundice is a common occurrence in medicine. Its appearance in epidemic or near epidemic proportions is less prevalent. In 1745, the first actual description of this latter form of jaundice available in the literature was made by Cleghorn,[1] who reported its prevalence on the island of Minorca. Records of subsequent years indicate that similar outbreaks were reported by other investigators. Blumer[2] reports the disease occurred in America during the War of 1812, and alleged outbreaks are said to have occurred since 1857 in the United States.

Several French and German writers have also described epidemics of jaundice.[3, 4] The outbreaks in Europe were noted to have affected primarily young male adults, particularly soldiers in trenches, sewer workers, and bargemen. In the description of the disease and in the reports of cases and outbreaks, the reference to etiological agent and possible sources of infection leads one to believe that these early investigators were dealing with more than one form of jaundice. At least it is not improbable that the infectious type was confused with the sporadic or catarrhal forms of jaundice.

The presentation of a clear-cut clinical picture of infectious jaundice was not accomplished until 1886. In that year Weil[4] published an account of 4 cases, characterized by chills, fever, myalgia, enlargement of the liver and spleen, occurrence of hemorrhages, and occasionally febrile relapses. It is on the basis of this excellent description of a relatively rare disease that the clinical condition described by Weil frequently bears his name.

A condition considered similar to Weil's disease had long been prevalent and recognized in Japan. In 1914, Inada and Ido and their associates[5] described this malady as it occurred in Japan. After careful animal experimentation and the repeated observation of spirochetes in the tissues of guinea pigs inoculated with blood from patients suffering from the Japanese form of Weil's disease, these workers concluded that the etiological agent was a spirochete. In 1915, Uhlenhuth and Fromme[6] announced that Weil's disease,

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

encountered among German soldiers, could be transmitted to guinea pigs by inoculating these animals with the patient's blood. In 1916, Huebner and Reiter,[7] apparently working independently, recognized a spirochete-like organism in the organs of animals inoculated with the blood of patients and chose to call the organism spirocheta nodosa.

Noguchi, in 1917,[8, 9] described in greater detail the organism isolated from cases of jaundice. He classified it as *Leptospira icterohemorrhagiae*. In a later publication of his studies he reported finding virulent strains of Leptospira in the carcasses of rats trapped in New York. These strains were found to be pathogenic to guinea pigs and agreed in immunity and agglutination reactions with the Japanese strain isolated by Inado, Ido, and their associates.

Non-pathogenic saprophytic spirochetes morphologically similar to *Leptospira icterohemorrhagiae* have been found in natural waters all over the world. Wolbach and Binger,[10] in 1914, found them in stagnant water. These organisms have since been found in mud of lakes and rivers, among decayed leaves, in puddles, slime, and in tap water. These water spirochetes are classified under the common name of *Leptospira biflexa*.

In addition to *Leptospira icterohemorrhagiae*, the pathogenic strains include *Leptospira hebdomadis*, the cause of seven-day fever of Japan; *Leptospira grippo-typhosa*, which causes the swamp fever of Europe; and *Leptospira canicola*, which produces a disorder in dogs resembling human icteroid infection. Of the various pathogenic forms named, *Leptospira icterohemorrhagiae* and *Leptospira canicola* are perhaps the most important. Certainly in the Detroit experience only these two types were encountered. Infections of *Leptospira icterohemorrhagiae* were the most prevalent. Even among jaundiced dogs 10 out of 12 sera examined gave positive agglutination reactions with this, the so-called classical strain of Leptospira. This experience is contrary to that of the California and Dutch observers who found infection among dogs to be primarily of the canicola type.

Weil's disease has been reported from all over the world. Schuffner[11] determined the serological identity of original strains isolated in the Netherlands, Japan, Germany, England, France, Italy, Greece, and the United States. He arrived at the conclusion that there exists a universal serologic specificity of *Leptospira icterohemorrhagiae*.

It is further propounded by Schuffner and Karl Meyer[12] that *Leptospira icteroides* are found only in environments accessible to rats. These animals carry the organisms in the tubules of the kidney and excrete them with the urine. Soil, food, and water contaminated with rat urine can become a potent source of infection. Rats obtained from all parts of the world have been examined and on an average 10 per cent have been found to be vectors of *Leptospira icterohemorrhagiae*, although some investigators have found as high as 33 per cent of the rats examined to be positive.[12]

Dogs may act as vectors of the true Weil's strain as well as *Leptospira canicola*. Schuffner[11] and Meyer[12] were able to isolate *Leptospira canicola* from persons suffering from an infection resembling Weil's disease. Bacteriologically and serologically, these investigators proved that human beings are susceptible to the dog-type of infection, and the result of such infection could be a symptom complex simulating Weil's disease. Although doubt is expressed regarding the possibility of acquiring *Leptospira icterohemorrhagiae* infection from a dog source, this question needs further consideration. In the course of the Detroit investigations[13, 14] a case of Weil's disease was encountered which epidemiologically appeared to be of dog

origin. The case was that of a 3 year old child who developed the disease within a week after his pet was returned from a veterinary hospital. The dog had been confined in the hospital because of infectious canine jaundice, which was later proved serologically to have been caused by *Leptospira icterohemorrhagiae*.

Dissemination of the etiological agent through water should be seriously considered. Schuffner and his associates place a great deal of credence in infections acquired from water, either through swimming, accidental immersion, or attempts at suicide through drowning. It is generally conceded, however, that contamination of the unbroken skin with water containing the pathogenic strains of Leptospira probably will not result in infection. If, however, the horny layers of the epidermis are removed, the underlying epithelium offers no obstacle to the invading parasite.

In at least 3 cases of Weil's disease encountered by the writer the infection was apparently acquired from water. In one instance the patient probably acquired his infection while retrieving a golf ball from a heavily polluted stream; in the second case, the patient apparently acquired his infection while constructing a boat well; and in the third case, the patient, while digging a sewer from a trailer camp to a boat lane, accidentally fell into the water. The mode of infection in another case was probably water, although the evidence was too meager to warrant a definite conclusion.

The report of the Lisbon [15] outbreak of Weil's disease indicates that the mouth and mucous membranes should be considered as important portals of entry for *Leptospira icterohemorrhagiae*. This unique outbreak occurred in 1931, and apparently the water from a public drinking fountain was the source of infection. Later it was shown that the underground aqueducts were rat-infested.

As has been noted, a wet environment favors the propagation of Leptospira, particularly is such environment favorable if the reaction of the water or soil is alkaline. When such environments are associated with rat infestation we can expect to find the greatest incidence of infectious jaundice. Because of these factors, certain occupations present greater risks than others. The incidence of leptospirosis is more prevalent among miners, bargemen, garbage workers, abattoir workers, soldiers in trenches, and rice field workers. It is even stated that among swimmers the greatest risk is to those who swim the crawl stroke, since the possibility of oral infection is greatest in this particular method of swimming.

None of the Detroit cases studied seemed to have acquired its infection while swimming. Six cases, 3 of which proved fatal, were encountered among poultry workers. These persons worked as poultry strippers, graders, and inspectors. There are, as a rule, great numbers of rats in such establishments, and the workers frequently experience minor cuts and abrasions. It is probable that the infecting agent enters the body through these cuts after having been deposited on the work tables by the rats. Two cases of Weil's disease, one of which proved to be fatal, were encountered among persons who were trapping and handling rats.

By virtue of its prevalence among certain occupational groups this disease has its greatest incidence among males, and particularly young adult males. Cases among children and females are rare. One case of the infection reported in this country affecting a female was acquired in a laboratory.

Weil's disease does not show any definite seasonal variation. Sporadic cases may occur throughout the year. It has been noted, however, that an increase in cases may be expected dur-

ing the late spring and early fall. This is probably due to increased rainfall and consequent establishment of more favorable environment for the Leptospira.

The incubation period in this disease is estimated by Schuffner to be between 4 and 19 days, with an average of 10 days. The majority of Schuffner's cases developed the disease in about 7 to 14 days after exposure.

From an epidemiological perspective, it is logical to assume that the disease should exist in this section of the country. Here we have the infectious element, the susceptible persons, and the occupational groups at risk. This expectation of cases has been substantiated by the Detroit experience. During the past 2½ years, 13 cases of Weil's disease were recognized in this city. The number of reported cases does not present a true picture of the actual incidence. Schuffner, from his experience, estimated that only 40 per cent of all cases develop clinically manifest jaundice. And yet the principal clue for the investigation of cases heretofore has been the apparent jaundice associated with signs and symptoms of an infectious disease. If other criteria were established for the recognition of such cases or if laboratories equipped to do Leptospira agglutination tests were more generally available, it is reasonable to assume that many more cases would be recognized.

LABORATORY DIAGNOSIS

Since Schuffner[11] first adapted the agglutination-lysis procedure to the laboratory diagnosis of Weil's disease its usefulness in epidemiology has been receiving an ever widening recognition. It is perhaps the best single laboratory procedure through which the etiological agent may be identified. The more recent studies of Schuffner,[16, 17] as well as those of Packchanian,[18] and Meyer and his associates[19] indicate that while Weil's disease is a distinct clinical entity, it may be due to infections of a number of serologically different strains of Leptospira. In view of these observations the laboratory which limits its serological studies in suspected cases to the use of only one strain of this infectious agent may fail in its purpose, and some cases of Weil's disease will remain undiagnosed.

Moreover, although the technic of this agglutination test is not difficult in itself, it is nevertheless important that the serologist who employs it should become proficient in recognizing the very slight reactions that often occur when the diluted serum is added to a thin suspension of Leptospira and the examination is made by means of dark-ground illumination. The difficulty of interpreting reactions will be greater when live suspensions are used. In order to obtain best results the test should be performed with formolized as well as live suspensions. The formolized antigen will serve to detect the Leptospira antibodies in the low-titered serum whereas their presence in high titer will be determined by the lysis reaction which occurs when the live antigen is employed.

Perhaps the greatest difficulty that will confront the laboratory desiring to equip itself for the diagnosis of Weil's disease will be in the maintenance of suitable cultures from which the antigen is to be prepared for the agglutination-lysis test. Cultivation of Leptospira in artificial media is not always the easy task that the literature on this subject would seem to imply. These organisms are very fastidious as to their cultural requirements, as was learned from our earlier disappointing experiences. A number of strains which seemed to be easily carried through several animal passages would suddenly die out when planted in artificial media, or, after showing apparently luxuriant growth after the first planting would fail to

develop upon being transplanted. The medium was prepared carefully and in accordance with Schuffner's formula which is given in detail in Meyer's recent report.[19]

When it was realized that Detroit tap water was not suited for the preparation of the culture medium, other waters were employed. Among those tried were specimens from running streams, from ponds, surface puddles and even rain and snow collected directly into glass receptacles. All were found to be unsatisfactory. Finally, during a heavy rainfall some water was collected as it drained down the side of a clay bank near the laboratory. This water was filtered through coarse paper and autoclaved. The fine particles which remained after this treatment were allowed to settle and the water was again filtered through paper. It was still slightly turbid when used to prepare the medium. Following the use of such water no more difficulty has been experienced in the cultivation of Leptospira. Over a period of approximately 5 months, three batches of medium have been successfully prepared. After 20 successive transplants there is no apparent abatement of growth in our stock cultures.

Analysis of the clay which was dissolved in this rain water shows it to be high in calcium, soluble iron, sulfates, and chlorides. In this connection it is interesting to note that Ono [20] mentions sodium chloride, calcium chloride, magnesium chloride, and ammonium chloride as being necessary for the growth of Leptospira.

Another factor considered essential for good growth of Leptospira is optimum temperature. Unless precautions are taken to prevent a rise above 30° C. in the incubator temperature the cultures may be expected to die out. During one summer period when the atmospheric temperature was unusually high it was difficult to maintain a low temperature in a small incubator and all of the cultures were lost.

Of the other laboratory procedures that may be employed as aids in the diagnosis of infectious jaundice none should prove difficult. These include: (1) inoculation of young guinea pigs with blood, urine, and tissue material obtained during the earlier stages of the illness; (2) examination of blood, urine, and tissue scrapings from the liver and kidneys by means of dark-ground illumination; (3) histological studies of tissues.

A routine laboratory activity based upon the five procedures discussed will greatly improve the diagnosis of Weil's disease, irrespective of the period following its time of onset. The very occasional cases which are encountered in the earlier stages of this disease will prove most satisfactory for the isolation of the Leptospira by means of animal inoculation or culture. Direct darkfield examinations of defibrinated blood as well as the urine from such cases should also be made for the Leptospira that may yet be present in the circulating blood or be excreted in the urine. In the later stages this procedure is less applicable and the agglutination-lysis test will remain the only useful method to be employed for the diagnosis. In the rare instance of fatal outcome of a case of Weil's disease, the necropsy will provide tissues which can be used for animal inoculation, culture, and for histological study. The silver technic will prove most helpful in the preparation of tissues for microscopic study, either by the impregnation of blocks or staining of the sections. In positive cases the Leptospira are very easily demonstrated in the kidney, liver, or spleen. In one of our experimental animals these organisms were also found in the meningeal blood vessels.

ACKNOWLEDGMENTS: The writers wish to acknowledge laboratory assistance and advice rendered by Dr. Karl F. Meyer and his staff

of the George Williams Hooper Foundation, San Francisco, and also the kindly assistance of Mrs. Norma H. Broom of the Detroit Department of Health.

REFERENCES

1. Cleghorn, George. *Observations on the Epidemic Diseases in Minorca, 1744 to 1749.* London, D. Wilson, 1751.
2. Blumer, G. *J.A.M.A.*, Vol. 81:353–58, 1923.
3. Larrey, D. J. *Memoires de Chirugoe Militaire et Campagnes*, Vol. 4, Paris, 1812–17.
4. Weil, A. *Deutches Arch. f. klin. Med.*, Vol. 39:209–32, 1886.
5. Inada, Ryokicki; Ido, Yutaka; Hoki, Rokuro; Kaneko, Renjiro. *J. Exper. Med.*, Vol. 23:377–402, 1916.
6. Uhlenhuth, P., and Fromme, W. *Med. Klin.*, Vol. 11:1202–03, 1264–66, 1296, 1375–77, 1915.
7. Huebner, H., Reiter, H. *Deutsche med. Wchnschr.*, Vol. 2:1275–77, 1915.
8. Noguchi, Hideyo. *J. Exper. Med.*, Vol. 30:95–107, 1919.
9. Noguchi, Hideyo. *J. Exper. Med.*, Vol. 25:755, 1917.
10. Wolbach, S. B., and Binger, C. A. L. *J. Med. Research*, Vol. 30:23–25, 1914.
11. Schuffner, W. A. P. *Roy. Soc. Trop. Med. & Hyg.*, Vol. 28:7–37 (June), 1934.
12. Meyer, K. F., Eddie, B., and Anderson-Stewart, B. *Proc. Soc. Exper. Biol. & Med.*, Vol. 38:17–19 (Feb.), 1938.
13. Molner, J. G., and Kasper, J. A. *J.A.M.A.*, Vol. 110:2069–70 (June 18), 1938.
14. Martmer, E. E. *J. Pediat.*, Vol. 14:48–50 (Jan.), 1939.
15. Ricardo, J. *Bull. Office Internat. d'hyg. pub., Bulletin Mensuel*, t. XXIV: pg. 88, 1932.
16. Schuffner, W. A. P., and Sieburgh, G. *J. Trop. Med.*, Vol. 30:48, 1927.
17. Schuffner, W. A. P., and Walch-Sorgdrager, B. *Bull. Office Internat, d'hyg. pub.*, Vol. 30:297, 1937.
18. Packchanian, A. *Am. J. Path.*, Vol. 14:638, 1938.
19. Meyer, K. F., Stewart-Anderson, B., and Eddie, B. *J. Am. Vet. M. A.*, Vol. 95:710, 1939.
20. Ono, S. *Fukuoka acta med.* (Fukuoka-Ikwadaigaku-Zasshi), Vol. 31:155, 1938 (German summary).

America is in a state of emergency. Every citizen is urged to do his part by buying Defense Savings Bonds and Stamps.

—Buy Defense Bonds and Stamps—

Tuberculosis Infection in Relation to Tuberculin Sensitivity in School Children*

Roentgenological Evidence—Second Report

R. S. GASS, M.D., WILLIAM J. MURPHY, M.D., E. F. HARRISON, M.D., RUTH R. PUFFER, F.A.P.H.A., AND W. CARTER WILLIAMS, M.D., F.A.P.H.A.

Tennessee Department of Public Health, Nashville, Tenn.

THE Tennessee Department of Public Health has devoted special attention to a study of tuberculosis in Williamson County since December, 1931. Throughout this period a remarkable tendency toward the deposition of calcium in the lung fields and tracheobronchial lymph glands has been noted. Apparently, calcified lesions as demonstrated by the x-ray are present in a greater proportion of individuals in this area than has been reported in other parts of the country.

Shortly after this study was begun it was noted, also, that these calcified lesions were demonstrable in a considerable proportion of individuals with a negative tuberculin reaction. With a view to determining to what extent this occurred, a survey was made in the spring of 1937 in which the children in attendance at nine white and three colored schools were both tuberculin tested and x-rayed.

Old Tuberculin was used in the survey. The intracutaneous method of Mantoux was employed, the test being made first with 0.01 mg. and, if this was negative, repeated with 1.0 mg. dosage. Readings were made 48 hours following administration. Chest radiographs were made on both positive and negative children and were read without reference to the tuberculin reaction. In this survey, the results of which have previously been published,[1] calcified lesions were noted with about equal frequency in both positive and negative groups.

In the spring of 1939 a similar survey was made in the same schools, employing a similar technic and using tuberculin of the same lot. Eleven hundred and thirty-two white and 280 colored children between the ages of 6 and 20 years were tested and x-rayed.

As in 1937, the tuberculin tests were read according to the degree or extent of the reaction. An area of edema surrounding the injection site of as much as 5 but less than 10 mm. in greatest diameter was read one-plus. Edema measuring 10 or more but less than 15 mm. in greatest diameter was read two-plus. Edema of 15 or more mm. in diameter was called three-plus. Any reaction, regardless of size, which resulted in necrosis was classed as a four-plus reaction.

---

* Read before the Epidemiology Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

All the films were read independently by two clinicians (R.S.G. and E.F.H.) without knowledge of the results of the tuberculin test. The two independent readings were then compared. In those cases in which a difference of opinion had occurred the films in question were withdrawn from the larger group and read jointly by the two clinicians. An attempt was made to classify the films according to the definiteness and degree of calcification noted. The following classification was used: 0 — negative, 1 — probable calcification, 2 — definite but limited calcification, and 3 — extensive calcification.

Of the 1,132 white children tuberculin tested, 83, or 7.3 per cent, were positive to the first test, 370, or 32.7 per cent, were positive to the second test, and 679, or 60.0 per cent, were negative. In the colored group 42, or 15.0 per cent, were positive to the first test, 68, or 24.3 per cent, were positive to the second test and 170, or 60.7 per cent, were negative. The results of x-ray examination of each of these groups are shown in Table 1 and Chart 1.

In both white and colored children a somewhat higher proportion of those reacting to 0.01 mg. of O. T. showed calcified lesions than was found in either of the other two groups. The smallest proportion of lesions was found in those negative to a milligram. These differences are rather small in the white groups and somewhat greater in the colored. In neither race did the proportion of children showing calcified lesions in each of the three groups appear to show significant variations by age. At all ages, however, a smaller proportion of colored children showed calcified lesions than was observed in the white.

Children with extensive calcifications were no more likely to react to tuberculin than were those with more limited

CHART I

X-RAY FINDINGS ACCORDING TO TUBERCULIN REACTION OF WILLIAMSON COUNTY SCHOOL CHILDREN, BY COLOR, 1939

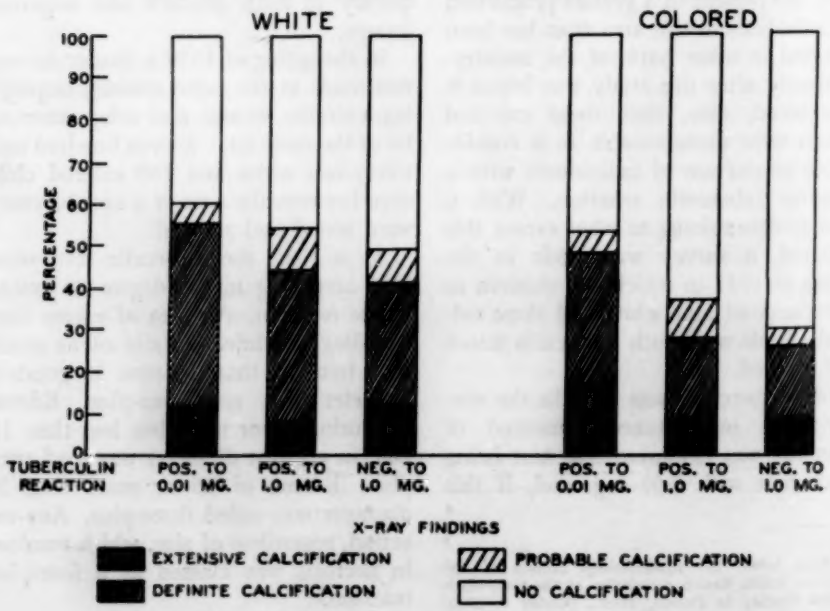


TABLE 1

X-ray Findings According to Tuberculin Reaction of 1,412 Williamson County School Children by Color, 1939

Calcification	Total Tested		Tuberculin Positive						Tuberculin Negative	
			Total		First Test (0.01 mg.)		Second Test (1.0 mg.)			
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
					White					
Total	1,132	100.0	453	100.0	83	100.0	370	100.0	679	100.0
Extensive	121	10.7	40	8.8	10	12.0	30	8.1	81	11.9
Definite	367	32.4	168	37.1	36	43.4	132	35.7	199	29.3
Probable	92	8.1	40	8.8	4	4.8	36	9.7	52	7.7
Negative	552	48.8	205	45.3	33	39.8	172	46.5	347	51.1
					Colored					
Total	280	100.0	110	100.0	42	100.1	68	99.9	170	100.0
Extensive	28	10.0	13	11.8	7	16.7	6	8.8	15	8.8
Definite	55	19.6	26	23.6	13	31.0	13	19.1	29	17.1
Probable	14	5.0	8	7.3	2	4.8	6	8.8	6	3.5
Negative	183	65.4	63	57.3	20	47.6	43	63.2	120	70.6

lesions. Of 121 white children showing extensive calcifications, 40, or 33 per cent, were tuberculin positive. Of 367 with definite but limited calcifications, 168, or 46 per cent, were tuberculin positive while of the 92 children showing probable calcifications 40, or 43 per cent, were positive. Findings in the colored children were not materially different.

After completion of the 1939 survey the records were checked against those of 1937 in order to identify those children who appeared in both surveys. Altogether, 573 white children and 150 colored children were tested and x-rayed in both 1937 and 1939. Since the number of colored children is relatively small, consideration is given here to the white group only.

The tuberculin test and x-ray findings in 1939 were compared with those made on the same children in 1937. The results of the tuberculin test in both years are shown in Table 2.

In 1937, 42 children reacted to the first test and 35 more showed a reaction of two-plus or greater to a milligram. In 1939, the readings on these same 77 children were identical in 20 cases, higher in 28, and lower in 29. Of the 29 who showed lesser reactions in 1939, 7 were read negative to a milligram.

Somewhat different results were obtained with respect to the 158 children who showed a reaction of one-plus to a

TABLE 2

Results of Tuberculin Testing of 573 White Williamson County School Children, 1937 and 1939

Tuberculin Reactions 1937	Total	Tuberculin Reactions, 1939							
		4+ to 0.01 mg.	3+ to 0.01 mg.	2+ to 0.01 mg.	1+ to 0.01 mg.	3+ to 1.0 mg.	2+ to 1.0 mg.	1+ to 1.0 mg.	Neg. to 1.0 mg.
Total	573	3	18	14	12	12	36	129	349
4+ to 0.01 mg.	..								
3+ to 0.01 mg.	12	3	6	3					
2+ to 0.01 mg.	14		9	2	2		1		
1+ to 0.01 mg.	16		2	5	2	2	1	3	1
3+ to 1.0 mg.	6				1	1	1	3	
2+ to 1.0 mg.	29			1	4	3	9	6	6
1+ to 1.0 mg.	158		1		2	5	15	58	77
Neg. to 1.0 mg.	338			3	1	1	9	59	265

milligram in 1937. The readings on this group in 1939 were unchanged in 58 cases, higher in only 23, and negative in 77.

This group of weak reactors makes up a large proportion of the total number of positives. In 1937, the children showing a reaction of one-plus to a milligram comprised 67 per cent of the total number of positive reactors, while in 1939 the corresponding figure was 58 per cent. Moreover, of the 73 children who were read negative in 1937 and positive in 1939, 59 fall within this group. Of importance, therefore, is the question of the specificity of these weak reactions as a measure of tuberculin sensitivity. Likewise, even though the test may be administered with care and all interpretations made by the same individual, consideration must be given to the possibility that in repeating the test on the same group of children a certain number of changes in readings may occur due to slight variations in technic or interpretation.

In comparing the x-ray readings of 1939 with those of 1937, degree and definiteness of calcification were not taken into consideration. All readings were classed as either positive or negative. Previous readings of extensive, definite, or probable calcification were all considered positive.

Where disagreements were noted between the 1939 and 1937 readings, both films were withdrawn and compared. This was done without knowledge on the part of the clinician as to the nature of the disagreement. A final reading was then given.

Table 3 shows a comparison of the 1939 readings with those made in 1937 together with the final interpretation.

Of 343 children classed as positive in 1937, 87 were read negative in 1939. Not all of these disagreements, however, resulted from variations in interpretation of the films. In 1937 a considerable number of lateral and oblique pictures were made on doubtful cases, whereas in 1939 only one single flat film was employed. The final readings on these 87 children indicated that calcium was present in 71 while 16 were negative.

Of 230 children called negative in 1937, 49 were read positive for calcium in 1939. Final readings indicated that calcium was present in 38, not present in 3, while in 8 there appeared to be an addition of calcium. It is noteworthy that in only 8 children did there appear to be an addition of calcium during this 2 year interval. This is in line with our findings which indicate that the proportion of high school children showing calcifications is not very much greater than that observed in children in the lower grades. It is apparent from these findings that readings made from a single flat film are subject to considerable variation in interpretation. Such variations are to a large extent eliminated when two or more films are employed.

The final readings represent interpretations based on at least two films.

TABLE 3

X-ray Readings of 573 White School Children Examined in Both 1937 and 1939

1937 Reading			*1939 Reading*			*Final Reading (Serial Films 1937 and 1939)*		
Calcium	*Number*	*Per cent*	*Calcium*	*Number*	*Per cent*	*Calcium*	*Number*	*Per cent*
Total	573	100.0	Total	573	100.1	Total	573	100.0
Positive	343	59.9	Positive	256	44.7	Positive	327	57.1
			Negative	87	15.2	Negative	16	2.8
Negative	230	40.1	Positive	49	8.6	Positive	46	8.0
			Negative	181	31.6	Negative	184	32.1

The net effect of increasing the number of chest radiographs was an increase in the proportion of positive readings. Thus, in 1937, 59.9 per cent of this group of children were read positive, 2 years later 53.2 per cent were read positive, while the final readings based on serial films gave a figure of 65.1 per cent.

It is reasonable to assume that with respect to both the tuberculin reaction and the x-ray findings a greater degree of accuracy may be expected from the combined results of the two surveys than from either one alone. With this in mind, the final x-ray readings were compared with the results of the tuberculin test in both years.

For the purpose of this comparison groupings were made according to the results of the tuberculin test. In group 1 were placed all those who were tuberculin positive in both 1937 and 1939 and who showed a reaction in one or both surveys of at least two-plus to a milligram. In group 2 were placed all those who were positive in one survey and negative in the other, as well as those who showed a reaction of one-plus to a milligram in both. Further breakdown of this group did not materially affect the results. In group 3 were placed those who were negative to a milligram in both surveys.

X-ray findings in each of these three groups are shown in Table 4.

A somewhat higher proportion of children in the first group show calcifications than is noted in either of the other two. The difference, however, is not great.

Of particular significance is the large number of children with calcifications in group 3. These children have all been negative to a milligram of tuberculin on two separate occasions and the x-ray findings are based on two or more films. If these calcified lesions are tuberculous in origin, the findings here presented indicate an appreciably higher level of tuberculous infection in this area than would be shown by the use of the tuberculin test alone.

TABLE 4

Final X-ray Readings of 573 White School Children Grouped According to Tuberculin Reactions in Both 1937 and 1939

Group	*Total*	*Calcification*	
		Number	*Per cent*
Total	573	373	65.1
Group 1	93	71	76.3
Group II	215	137	63.7
Group III	265	165	62.3

SUMMARY AND CONCLUSIONS

Calcified lesions as demonstrated by the x-ray are found in a large proportion of school children in Williamson County. In a group of 573 children tested and x-rayed on two separate occasions, lesions were demonstrable in 373, or approximately two-thirds of the total number. A majority of these lesions are present by the time the child enters school. In school children there is little association between these calcifications and the tuberculin reaction. Though these lesions may have little clinical significance, if they are tuberculous in origin they would be of definite epidemiological importance in any attempt to estimate the prevalence of tuberculous infection in this area.

REFERENCE

1. Gass, R. S., Gauld, R. L., Harrison, E. F., Stewart, H. C., and Williams, W. C. Roentgenological Evidence of Tuberculous Infection in Relation to Tuberculin Sensitivity in School Children. *Am. Rev. Tuberc.*, 37:4 (Oct.), 1938.

Studies of Rebaking Cream-Filled Pastries*

F. W. GILCREAS, F.A.P.H.A., AND MARION B. COLEMAN, F.A.P.H.A.

Division of Laboratories and Research, New York State Department of Health, Albany, N. Y.

IN spite of the widespread publicity regarding the rôle of cream-filled pastries in food poisoning, the number of outbreaks attributable to them proves that either the bakers or the consumers fail to take the necessary preventive measures.

Stritar, Dack, and Jungewaelter [1] and Korff [2] have reported that custard-filled pastries may be reheated to destroy staphylococci without impairing the flavor or appearance of the product. Korff states that about 15 bakeries in Baltimore were using this procedure in 1936 and finding it satisfactory. There is no evidence, however, that bakeries in general recognize its importance. It therefore seems desirable, in order to provide further data in support of the practice, to report the results of a few experiments undertaken for purposes of confirmation.

Experiments were conducted to determine: (1) the time and temperature of rebaking necessary to render nonviable an enterotoxigenic strain of staphylococcus in the custard filling in eclair shells; and (2) the palatability of rebaked custard-filled eclairs, chocolate cream pie, and Boston cream pie.

* Read at a Joint Session of the Laboratory, Food and Nutrition, and Epidemiology Sections of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

EXPERIMENT I

The eclair shells used were purchased from a local bakery, and the boiled custard was made in the laboratories for the preparation of media. Each experiment was repeated on three different days.

CUSTARD

Milk	225 ml.
Water	100 ml.
Saccharose	53 gm.
Cornstarch	15 gm.
Sodium chloride	0.5 gm.
Eggs	1
Vanilla	3 ml.

The milk and 80 ml. of water were combined and heated in a double boiler. The saccharose, cornstarch, and salt were mixed with the remaining water and the slightly beaten egg. Part of the hot milk and water was added slowly to the cold ingredients, and the whole mixture was cooked in the double boiler until thick. This custard was dispensed in glass jars and autoclaved for 20 minutes.

Inoculum—The strain of *Staphylococcus aureus* used was isolated from an infected wound on the hand of a baker who prepared cream puffs that had induced food poisoning. Cats fed with boiled custard in which this strain had been grown vomited and had diarrhea.

The custard was inoculated with a broth culture of the staphylococcus and stirred with a sterile spoon. It was kept at room temperature for 2 hours, after

which the eclair shells were filled by means of a 20 ml. syringe.

Baking—Two shells filled with inoculated and one with uninoculated custard were included in each experiment. Each group of three eclairs, on a rack in a covered baking pan, was placed in a well insulated electric muffle furnace previously heated for 4 hours to insure an even temperature. Heating periods of 15, 20, 30, and 40 minutes were employed in each experiment. During the baking, the temperature was maintained between 216° and 220° C. (420°–428° F.); rapid manual control within the muffle was possible by use of a rheostat and a thermometer inserted through the furnace door.

At the end of each baking period, the pan was removed, the cover lifted, and a thermometer thrust into the uninoculated eclair. Two minutes were allowed for the mercury to come to equilibrium, after which the cooling rate of the custard was observed. The eclairs were immediately transferred to a wire rack to facilitate rapid cooling.

Bacteriologic examination—The following samples (0.5 ml.) of the custard were examined: one immediately before the shells were filled, four from each eclair immediately after baking and cooling, and one after the rebaked pastries had remained at room temperature overnight. The samples were collected with a 1 ml. syringe, and each was thoroughly mixed with 4.5 ml. of beef infusion broth to make a 10-fold dilution. From this, 100-, 1,000-, and 10,000-fold dilutions were prepared with broth. Poured plates were made from (1) the 10,000-fold dilution of custard before filling the shells, (2) the 10-fold dilution after baking and cooling, and (3) all four dilutions after the rebaked pastries had been left at room temperature overnight. Promptly after preparation 1 ml. of each dilution was pipetted into a Petri plate, and 12–15 ml. of melted dextrose beef infusion agar were added. The plates were incubated for from 18 to 20 hours.

All the broth dilutions of custard samples collected after baking were also incubated and examined on the following day.

RESULTS

1. Bacteria counts showed the presence of from 200,000 to over 3,000,000 bacteria per ml. (most of which may be assumed to be staphylococci) immediately before the shells were filled.

2. In the filling from eclairs that had been heated for 15 minutes or longer, no viable staphylococci were demonstrated either immediately after cooling or after they had remained at room temperature overnight. Heating longer than 20 minutes was found impractical as the shells became definitely toasted; heating for 30 minutes or longer produced charring.

3. The temperature of the cream filling remained above 71° C. for over 5 minutes after removal from the oven; thus the thermal conditions were well above those of short-time pasteurization, 71° C. for 15 seconds.

EXPERIMENT II

The experiments to determine the effect of rebaking on the appearance and palatability of custard-filled pastries were carried on in the staff luncheon room under the direction of a member of the laboratory staff. Eclair shells and custard filling were prepared by the cook in the usual way. After the shells were filled, one-half of them were returned to the gas oven in which the temperature was held at 216° C. for 20 minutes. After removal from the oven, they were transferred to a wire rack to allow free circulation of air and, when cool, were topped with chocolate icing. In this experiment it was observed that toasting or charring occurred more quickly in sheet-iron pans than in aluminum pans.

These eclairs were served to 15 members of the staff, and some prepared at the same time but not rebaked were served to 19. As each person left the luncheon room, his opinion regarding the pastries was asked. Only 3 individuals who had eaten the eclairs knew that the experiment was being conducted; the only one who gave an adverse criticism was one of these, who had had a rebaked eclair. Indifference was expressed by 3 persons, 2 of whom had rebaked pastries. The remaining 30, 12 of whom had rebaked eclairs, all reported favorably. No appreciable difference in the taste of the pastries before and after rebaking could be detected. In some instances, the rebaked shells showed evidence of a slight toasting but this did not impair the flavor.

On another day, one of a number of chocolate cream pies prepared in the usual way was returned to the gas oven at 216° C. for 20 minutes. When cool, it was topped with whipped cream and served to 6 members of the laboratory staff, 3 of whom knew of the rebaking and 3 who did not. All reported the food very satisfactory.

Boston cream pie was also rebaked and served in the luncheon room. The cake was prepared and baked as usual and two layers with a custard filling returned to the oven at 216° C. for 20 minutes. This dessert was served to 10 members of the staff, and a Boston cream pie prepared from the same ingredients but not reheated, to 10 others. Unqualified approval was expressed in regard to the rebaked pie as well as the other.

DISCUSSION

This method of rebaking eclairs or cream puffs and Boston cream pie minimizes the opportunity for introduction of enterotoxigenic microörganisms. The use of freshly prepared custard and prompt rebaking are, of course, essential to insure the absence of preformed thermostabile toxins. Korff reported that the method followed by the Baltimore bakers consisted of rebaking one layer of cake with the custard on it. When cool, the second layer of cake was placed upon this. Obviously, the filling in this cake might become contaminated. It is also true that the cream filling in a pie rebaked as in our luncheon room and topped with whipped cream when cool would be subject to contamination. Such pies prepared in bakeries, however, are almost invariably topped with meringues. It is suggested that after rebaking for 15 minutes the pie be removed from the oven, topped with the meringue, and returned to the oven at a lower temperature, about 148°–162° C. for approximately 8 minutes, the time necessary to bake the latter.

CONCLUSIONS

Staphylococci in custard filling in eclair shells were rendered nonviable by heating for 15 minutes at from 216° to 220° C. (420°–428° F.).

Rebaking eclairs, chocolate cream pie, and Boston cream pie for 20 minutes at 216° C. did not impair the appearance or palatability of the pastries.

The adoption of this procedure in bakeries should reduce greatly the incidence of food poisoning induced by the enterotoxins of staphylococci in custard-filled products.

REFERENCES

1. Stritar, Joseph, Dack, G. M., and Jungewaelter, F. G. The Control of Staphylococci in Custard-filled Puffs and Eclairs. *Food Research*, 1:237–246, 1936.
2. Korff, F. A. Pasteurized Pastries Prevent Disease. *Baltimore Health News*, 13:144–146, 1936–37.

Types of Personnel in Public Health Statistics*

THE Preliminary Report of the Subcommittee on the Educational Qualifications of Public Health Statisticians, approved by the Committee on Professional Education, of the American Public Health Association, was published in the AMERICAN JOURNAL OF PUBLIC HEALTH, July, 1937. It was approved later, October 25, 1938, by the Governing Council of the American Public Health Association.

Recently the report was submitted to a small group attending the Second National Conference of State and Local Registrars held in Washington, D. C., March 28, 1941, for deliberation and suggestions for revision in case the group should feel that modifications are desirable in view of the expansions in public health work and administration which have occurred in public health with particular reference to public health statistics, since the publication of the report. The group to whom the report was referred for study was made up of the following:

S. D. Collins, Ph.D., Principal Statistician, U. S. Public Health Service
H. L. Dunn, M.D., Chief Statistician for Vital Statistics, Bureau of the Census, U. S. Department of Commerce
Marguerite F. Hall, Ph.D., Assistant Professor of Public Health Statistics, University of Michigan (Chairman—representing Dr. Sundwall)
J. T. Marshall, Director Division of Vital Statistics, Provincial Board of Health, Victoria, British Columbia; also President of the American Association of Registration Executives

The group is of the opinion that there is no need for a revision of the report at the present time. However, it feels that the time has come when we should recognize several types of personnel in the field of public health statistics. The following types are identified:

I. *Major Types:*

1. *The Statistician - Coördinator*—Technical assistant and adviser to the health commissioner. The interests and activities of the statistician-coördinator should be largely in investigation and research. In addition to meeting the educational qualifications specified in the Report on the Education Qualifications of Public Health Statisticians, he should possess a broad background of experience which will enable him to serve as a consultant in the setting up of problems emanating from the directors of the several divisions or bureaus of a department of health and also in the analysis and interpretation of the statistical data accruing from the treatment of the problem. He should also be interested in and capable of initiating research and investigation in matters pertaining to public health administration.

2. *The Statistician-Registrar* — The functions of the statistician-registrar

* Report presented by John Sundwall, M.D., Chairman of the Subcommittee on the Educational Qualifications of Public Health Statisticians to the Committee on Professional Education at its meeting on April 18. It represents comments made to the subcommittee by a small group who attended the Conference of State and Local Registrars in Washington on March 28, 1941, and is published here in order to encourage expression of opinions from all who are interested.

should be those ordinarily ascribed to a supervisor, chief, or director of a bureau or division of vital or public health statistics in a governmental department of health. He should meet the educational qualifications specified in the report.

3. *Statistician*—The statistician, who should also meet the educational qualifications recommended in the report, should serve as an assistant to the statistician-registrar or to the statistician-coördinator. He should or may look forward to a career as a statistician-registrar and perhaps eventually as a statistician-coördinator.

It is apparent that it is only in the larger departments of health that these three major types of personnel in public health statistics will be employed. However, they are now being identified and the American Public Health Association should recognize them. The educational qualifications of these three major types of professional personnel in public health statistics are the same as specified in the Report on the Educational Qualifications of Public Health Statisticians of the Committee on Professional Education of the American Public Health Association. Satisfactory experience and personal qualifications will largely determine the selection of personnel for each type or grade of service. Generally, it will be progression from one type to another.

II. *Minor Types:*

1. *Junior Statistician* — The educational preparation of the Junior Statistician should include courses of study in mathematics and statistics adequate to do intelligent routine statistical work, including operation of the machineries utilized in statistics. He need not meet the broad educational qualifications in the physical, biological, and social sciences and in public health as specified in the report. The junior statistician acquires his knowledge largely through apprenticeship or interneship in the statistical division of a health department.

2. *Statistical Clerk*—Capable of carrying on routine statistical work in a local unit. No special educational qualifications are specified for this type of personnel. It need not be as basic as that of the junior statistician.

With a view of obtaining the reactions of public health statisticians, public health officers, and other personnel to these recommendations relative to the classification of public health statisticians, it is recommended that this "Follow-Up" Report on the Educational Qualifications of Public Health Statisticians be published in an early number of the AMERICAN JOURNAL OF PUBLIC HEALTH.

Comments and suggestions are solicited from all who are interested.

JOHN SUNDWALL, M.D.,
Chairman

Comparison of Undechlorinated and Dechlorinated Swimming Pool Waters*

24 and 48 Hour Plate Counts of Samples

Discussion by C. A. HOLMQUIST, F.A.P.H.A., State Department of Health, Albany, N. Y., of a paper by THOMAS M. RIDDICK, M.S.C.E., which appeared in August issue of the JOURNAL.

THE paper by Mr. Riddick focuses attention upon the satisfactory results secured when properly designed and constructed swimming pools are operated under technical control. Mr. Riddick seems to emphasize four important factors, namely: (1) Samples of chlorinated water collected at swimming pools should be dechlorinated at the time of their collection. (2) The number of miscellaneous bacteria in swimming pool water was maintained in the pools under discussion lower than required by even rigid standards. (3) The 48 hour agar count of samples of chlorinated water more closely parallel the concentration of coliform organisms than is the case with the 24 hour count. (4) The concentration of residual chlorine was increased with higher bathing loads rather than a constant value being used for control purposes.

The desirability of dechlorinating samples as they are collected from swimming pools is well established and need not be discussed at this time.

Experience has indicated that properly operated pools will meet rigid requirements as to bacterial quality of the water, whereas improperly operated pools fail to meet even the more lenient requirements. This does not indicate, however, that a quantitative bacterial standard has been developed which is based upon definite proof that failure to meet the standard will indicate that the use of the pool would constitute a menace to the health of the bathers. Therefore, any official standard stating definite requirements which must be met to justify the issuance of a permit to operate a pool by the enforcing agency cannot be as rigid as advocated by Mr. Riddick.

It seems pertinent, therefore, to analyze the implications of existing quantitative standards as to bacterial quality of water referred to by Mr. Riddick. The bacterial standard for potable water serving interstate carriers, in effect, requires that 50 per cent of a series of samples will have a coli index of 1.05 or less per 100 ml. of water, but permits 5 per cent of the samples to have an index of 8.8 or greater per 100 ml.

The quantitative requirements suggested in the swimming pool standards developed by the committee of the American Public Health Association on "Swimming Pools and Other Public Bathing Places," namely, that not more than 15 per cent of the samples shall be positive in one or more 10 ml. portions of the samples examined states in effect that not more than 15 per cent of the samples may have more than 2.2 coliform organisms per 100 ml. This is

* Read before the Engineering Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 9, 1940.

equivalent statistically to requiring a quality of water superior to that outlined above for potable water.

The present requirements of Regulation 10 of Chapter VI of the New York State Sanitary Code, which Mr. Riddick regards as lenient, also are in reality more stringent than the above mentioned potable water standards, inasmuch as the regulations specify that not more than 40 per cent of the 10 ml. portions of a series of samples may be positive, which is equivalent to saying that the *maximum* permissible coli index is 5.0 per 100 ml. of water. Because of this situation, we are now considering enacting a standard which would be somewhat more lenient than those for potable water, yet sufficiently positive to secure the desired results. Such standard would provide an average coli index of 2.2 per 100 ml. or less, provided the index is less than 38 per 100 ml. in 90 per cent of the samples. Such a standard would be worded as follows:

Tests for Organisms of the Coli-aerogenes Group—Not more than 50 per cent of the samples in a series of samples collected from an artificial pool shall have a "Most Probable Number Index" for organisms of the Coli-aerogenes group, exceeding 2.2 per 100 ml. of water and not more than 10 per cent of the samples in the same series shall have such an index exceeding 38 per 100 ml. of water.

In the present state of our knowledge regarding bacterial quality of water in swimming pools, no definite conclusions can be reached as to the sanitary importance of numerical number of miscellaneous bacteria developing on agar after either 24 or 48 hours incubation. Pending the discovery of a specific "indicator organism," which is related biologically to some significant group of pathogens of importance in the control of swimming pools, stress will have to be placed upon the maintenance of a "state of cleanliness" in a pool as is the case with dishwashing technic. The 37° agar count seems to serve as a satisfactory indicator of cleanliness but we have no quantitative evidence that the 48 hour count in itself is any more significant than the 24 hour count. On the other hand, the data collected by Mr. Riddick disclose that the 48 hour agar counts are correlated much more closely with the concentration of coliform organisms than is the case with the 24 hour count, due, of course, to the presence in chlorinated swimming pool waters of organisms which develop slowly on agar. It is hoped, therefore, that Mr. Riddick's paper will stimulate additional investigation of this subject in order that additional data may be available to support any needed modification of the present bacterial technic.

The policy of increasing the concentration of residual chlorine maintained in pools with increases in bathing loads is not generally practised because most operators apparently consider that the increase in the chlorine dose made to compensate for the increase in the chlorine demand incidental to changes in the bathing load will maintain uniform disinfection by the resulting uniform concentration of residual chlorine. There is growing evidence, however, that the "activity" of any given concentration of residual chlorine is influenced by the organic content of the water. Therefore, correspondingly higher concentrations of residual chlorine seem to be needed with increases in organic content to be anticipated with increasing bathing loads.

This subject has many ramifications not referred to in Mr. Riddick's paper, but it would seem that greater attention should be given to those factors which modify the rapidity of disinfection by chlorine, such as pH, ammonia content, organic content, the effect of sunlight, temperature, etc., in order that practical guides may be developed for use by swimming pool operators. Pending the development of a simple technic for determining the oxidation potential of

water or its equivalent, greater attention should be given to comparison of the relative values secured by the so-called "flash test" with the more acid (20 per cent) orthotolidine reagent and the conventional orthotolidine test, to disclose the "state of activity" of the residual chlorine present.

There is need for technical discussion of the problems in the operation of swimming pools similar to this paper by Mr. Riddick.

The Mothers' Charter

EVERY potential mother envisions the pleasures and obligations of creating and sustaining new life and is entitled to health and protection for the benefit of herself and humanity and she should have:

1. The inherent right to be well born without inherited or transmitted defect or disease.
2. The inalienable right to protection from disease and harmful influences.
3. The opportunity to learn and know herself during adolescence and maturity and to acquire a knowledge of the origin and significance of human life.
4. The right to protection from pitfalls of married life and to a knowledge of its significance to herself and her potential family.
5. The privilege of proper premarital and preconceptional medical examination and advice and care for herself and her mate.
6. The right of proper and adequate care during pregnancy.
7. The right to receive adequate and necessary care during labor in her home or hospital.
8. The right to have appropriate care following labor in her home or hospital.
9. The right to secure proper and continuing subsequent care for herself and baby.
10. The right of preservation of health and life and happiness for herself and family.

A "Mother's Charter"—drafted by Dr. Fred L. Adair, Chairman of the American Committee on Maternal Welfare.

Organization, Supervision, and Objectives of Prenatal Medical Care*

E. D. PLASS, M.D.

Professor and Head, Department of Obstetrics and Gynecology, State University of Iowa, Iowa City, Ia.

PRENATAL supervision has been so widely accepted in principle by both the profession and the laity that there is no longer any need to argue its value or defend its practice. The idea that medical supervision might help reduce maternal and infant mortalities took shape early in this century, but had a long hard struggle for recognition in a medical world dedicated to curative technics. Eventually, however, the statistical evidence accumulated from personal and group experience, bolstered by confidence in the growing science of preventive medicine, has shown its virtues, and a certain part of the recent remarkable improvement in maternal death rates is commonly attributed to its influence.

The objectives of prenatal care are to provide "complete supervision of the pregnant woman in order to preserve the life, health, and happiness of the mother and child" and to "enable her to withstand the unavoidable strain associated with labor and delivery." It is only through such attention that "diseases which may cause death or disability of either the mother or the child may be avoided, arrested, or cured."

Obviously these objectives may be attained through the usual physician-patient contacts or through group or clinic practice. There can be little doubt that the former is the more desirable, provided the attendant is specially trained in obstetrics, is conscientious in his attention, and can be adequately remunerated for his services. Probably the best available prenatal care is that provided by the obstetric specialist to his private clientele; just as the most inadequate supervision is offered by the general practitioner who is interested only in curative medicine. At least in certain areas, one fact which has militated against proper antepartum attention by individual practitioners is the practice of charging for prenatal visits on the office-call basis rather than making a single charge for obstetric patients, which includes not only the delivery, but necessary antepartum and postpartum attention and advice. It is believed that cessation of the older practice would do much toward improving the situation, and that the younger generation of medical men will eliminate it and its disadvantages.

There is, however, a large group of childbearing women, possibly 50 per cent of the whole, who do not have the financial resources to seek prenatal care on a private patient basis, and who must therefore either forego its advan-

* Read before the Maternal and Child Health Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

tages or attend clinics when and where available. The larger general and maternity hospitals in the more populous areas conduct more or less elaborate prenatal establishments in connection with their general clinic work. In most of these institutions the antepartum clinics are under the supervision of trained obstetricians and are manned by younger men who aspire to that distinction and who look upon the work as a valuable part of their training. The proximity of various laboratories and special diagnostic equipment and the availability of expert consultants make for efficiency, but the multitude of patients and the changing clinic staff destroy much of the personal relationship which is such an important part of private practice. These patients probably receive care which is surpassed, if at all, only by the well-to-do who can command individualized expert attention. There can be no doubt that adequate medical supervision without the personal contacts is more effective than a deluge of personality with no sound medical approach. If the poor patient really wants proper care and will look for it in the larger cities, she can find it.

In smaller communities and rural areas the situation is much more difficult because of the absence of large hospitals and well trained specialists. A certain amount of excellent prenatal supervision is provided by individual physicians, but until recently facilities for giving such service to those in the lower economic groups was practically nonexistent. The extent of the problem is indicated by the fact that up to July 30, 1939, the health departments of 34 states had established 1,190 maternity centers through the coöperation of the Children's Bureau under the Social Security Act. In spite of this federal contribution, there were approximately 2,500 counties where nó state supported clinics were in operation and where group prenatal care was available only through an unknown, but not large, number of clinics conducted by hospitals, outclinics, and other public and private agencies. It seems fair to assume that hundreds of thousands of pregnant women have no opportunity to receive any prenatal supervision.

The organization of adequate prenatal programs in the larger institutions presents a simple problem because of the availability of trained personnel and modern facilities, but the development of effective units in smaller communities is far more difficult. The standards of prenatal care, as developed originally by the American Committee on Maternal Welfare and later adopted and amplified by the Children's Bureau, are relatively simple—a careful history, a complete physical examination, and simple laboratory tests. The collection of these data, with few exceptions, can be carried out by any practising physician, but their interpretation demands special training and experience so that the information elicited may be of the utmost value to the patients. It is for this reason that obstetric specialists are best equipped for this work. When they are not available, as is frequently the case, certain local physicians who are interested in obstetrics should be assigned to the work, preferably those who have had some special training. Provision should then be made to give the chosen group some form of instruction so that there may be uniformity of practice.

It may be suggested that the community physicians serve the clinic in some form of rotation. Aside from the objection that this would completely eliminate uniformity of procedure and conformity of advice, it should also be recognized that many members of the profession are equipped neither by temperament nor training to carry on the program. The smaller the number who coöperate, consistent with the size of the clientele, the more efficient the effort is likely to be. Not only will responsi-

bility be more localized but there will be more opportunity for the individual patient to have the type of continuous advice and counsel which is the essence of private patient care. Moreover, certain of the standard requirements, such as pelvic mensuration and early bimanual vaginal examination, require constant practice if the results are to be dependable. The mere fact that a pelvimeter is available and used has no significance—it must be employed correctly.

It is advisable for these small and occasional clinics to have available a consultant who can give advice on those complications which inevitably arise. In some states this need has been met by the appointment of a consultant who makes periodic visits to each clinic to advise with the local practitioners and to examine patients about whom there is some question.

If one assumes that any care is better than none, it must be agreed that any organized prenatal clinic is meeting the objectives of the program to a greater or less extent. There is, however, good reason to believe that in many instances it is less rather than greater. For example, it is reliably reported that in one rural area where 14 practitioners were receiving generous remuneration for providing prenatal care to an indigent group, there were only 2 pelvimeters available. The agreement also provided that each prenatal case report should contain the original record of the serologic test for syphilis from the state laboratory. One participant who was unfamiliar with the technic of venipuncture introduced reports covering the test on cord blood, thus complying with regulations even though he completely nullified the purpose of the requirement. It took some time to eliminate these difficulties, but the work is now progressing smoothly and the community is better for it—both maternal and infant death rates have been materially reduced.

It is always dangerous to generalize, but on the basis of a limited contact, it is my belief that prenatal supervision as it is now carried out frequently fails to meet its objectives and that the recognized standards are not being met, or are being followed only in form and without serious effort to develop their full usefulness.

Education and supervision apparently offer the best chance for improving the situation as it now exists. Elaborate physical equipment is not required, since there is need only for sufficient space for the patients and staff, and for ordinary clinical facilities. One or two dressing rooms and examining tables should be available, with scales, pelvimeters, sphygmomanometers, and an assortment of specula, catheters and similar instruments. There should be an arrangement for carrying out the simpler laboratory examinations and the possibility of having more technical investigations made in a nearby institution. Those who operate prenatal clinics should be carefully chosen on the basis of interest and training, and should then if possible be subjected to additional instruction not only in the performance of the various technics but in interpretation of the results. Moreover, arrangements should be made for periodic visits by a specialist consultant.

It seems obvious that any great future expansion of prenatal clinics will be under the aegis and with the financial support of some governmental agency, a situation which will be deplored by many, but which should lead to more uniform and better care. Attention should be given to securing continuity of contact and advice in order to preserve the desirable features of the physician-patient relationship. The personnel of the clinics should be chosen on the basis of interest, ability, and conscientiousness, and provision should be made not only for their continued instruction but for periodic and adequate specialist consultation.

MILBANK FUND ANNUAL CONFERENCE

FOREWORD

FOR the first time in the history of the Milbank Memorial Fund the reports on one of its annual conferences, by invitation, appear in the AMERICAN JOURNAL OF PUBLIC HEALTH. My sincere thanks for this opportunity are due to the Executive Secretary of The American Public Health Association, to the Editor of the JOURNAL, and to its Editorial Board.

The pattern of these annual conferences has been set as the result of long experience, but there is nothing fixed or rigid about the subject matter. Each subject is discussed at a round table; after the subject has been selected, a score of the leading authorities, particularly those who have thrown fresh light on the subject or developed new points of view, are invited to participate. Free discussion on a high technical plane is secured when attendance at the round table is restricted to a score of those who are thoroughly familiar with the subject, and who have something tangible to contribute.

As the Milbank Memorial Fund concerns itself with the public health, the subjects of discussion at its round tables relate in general to that field. But to fit the case, that relationship must be broadly interpreted. The main task of an official health agency is to apply, for the benefit of its people, public health measures which experience has shown to be effective. The Fund on the other hand has no such responsibility. It is concerned with the growing edge of public health work. It is its business to explore, experiment, appraise, and question to the end that new effective ways of preventing disease and maintaining health may be found and discredited methods abandoned. This is an enormous task which no single agency could undertake single handed. Fortunately it is shared by many private and official agencies so that small contributions from several add up to a respectable total.

Many health officers may be surprised to note that the results of research into problems of population were the subject of discussion at one of the three round tables. It is true that health departments are concerned with births and deaths, but it is not usual for them to go more deeply into problems of population. Nevertheless, accurate knowledge of population trends is essential to the public health statesman, for these trends may very largely determine the character of the problems which will confront health departments in future. The decline in the incidence of the infectious diseases of childhood is due in part to the decline in the relative number of individuals in this age group, and these infectious diseases will continue to decline from this cause alone. The importance of health problems associated with adult life and old age is greatly increased by present population trends, and maternal and infant health may be improved or worsened by the presence or absence of facilities for spacing births.

Studies of fertility levels in this country have shown that a disproportionately large amount of the population increase comes from a few regions in the country where health, educational, and economic facilities are the poorest. This may have

some bearing on the fact that little improvement is noted in the results of selective service examinations since 1917.

All of the subjects assigned to the three round tables have some bearing on the defense of our country in this emergency. New methods of waging war have placed the whole population under stress; any weakness in the civil population affects the efficiency of the whole war machine. Production of the weapons of defense is just as important as the proper use of those weapons. We must learn to maintain the health of defense workers at as high levels as that of the armed forces. Under these conditions the public health has come to assume new significance; the state has a greater interest than ever before in the physical and mental health of its citizens.

The Round Table on Health Problems in National Defense brought out the striking fact that approximately 40 per cent of our young men (21–35) are either unfit for military service or are suited for limited service only. Should the need arise for larger armed forces, it is probable that standards would be lowered and greater numbers inducted in spite of certain physical defects. It should be borne in mind that defects which incapacitate an individual for military service also make him unfit as a rule for efficient work in a defense industry. Lowering of standards would result in less effective army, navy, and air force. Employment of the rejectees in industry must have a similar result.

The growing edge of public health is strikingly represented by the report of the Round Table on Nutrition in National Defense. Here is a vast new field whose possibilities have hardly been explored. Someone has suggested that the recent decline in maternal mortality may be due to the improved diets of pregnant women on relief. Certainly the report from Toronto would appear to show that both mothers and infants emerge from labor in vastly better condition if the inadequacies of the mother's diet from the fourth or fifth month of pregnancy are properly supplemented. The full report of this study is to appear in an early number of the *Journal of Nutrition;* it should be read by every health worker.

The reports which follow are summaries of the individual reports presented to each round table and of the discussion which followed. Some of the papers prepared for the Conference will appear in the Milbank Memorial Fund's *Quarterly,* to which the reader may be referred for more detailed information. A feature of the Annual Conference which cannot be included in the JOURNAL is the cross-discussion at the concluding general session by participants from the different round tables. Such cross-discussion has been likened to cross-fertilization; it is an attempt to break down some of the mental barriers which are too apt to separate specialists in one subject from those working in allied fields.

Unfortunately, it is impossible to widen the circle of those who attend the conference without destroying at least some of its effectiveness. For this and other reasons, I am most grateful to the editors of the JOURNAL for making these reports available to so large a number of interested readers.

FRANK G. BOUDREAU, M.D.
Executive Director

HEALTH PROBLEMS IN NATIONAL DEFENSE*

G. CANBY ROBINSON, M.D., *Chairman*

IT is safe to say that never before has medical knowledge and skill been at a higher level than at present; that public health work is more efficient and better organized than ever before; our standard of living has attained a relatively high level; our steadily declining mortality is a favorable expression of national health. In spite of these attainments, now that we are in a state of national emergency, we are faced with the fact that about 40 per cent of the young men of our country at ages 21 to 35 are either considered physically unfit to enter training for military service or are fit for limited service only. This fact may be considered as an important index of our national health at ages which are economically the most productive years of life. The physical status of the civilian population, because of its industrial and social value, is of grave concern to us, and it is this problem of health in national defense that was the subject of our round table conference.

A review of present scientific opinion concerning prevention or correction of the defects and conditions which are the most frequent causes of rejection of young men called for training by the Selective Service System, was our chief concern. As a background for our discussion, preliminary data, giving the detailed causes of rejection by Selective Service local boards and induction centers, were presented by Mr. G. St. J. Perrott. Twenty-eight per cent were classed as unfit for any military service, and an additional 15 per cent were considered as fit for limited service only. The leading causes of rejection were: defective or deficient teeth, eye diseases, orthopedic impairments, diseases of the cardiovascular system, nervous and mental diseases, hernia, tuberculosis, and venereal disease.

The most striking difference between the results of 1917–1918 and today is the present high percentage of rejections because of defective teeth, which are over four times as high as in the World War draft. These results may point to an increase in the prevalence of dental disease since 1918, although other factors are undoubtedly involved.

Rejections for respiratory disease (largely tuberculosis) are only a little lower than in the World War (1.7 per cent as compared with 2.0 per cent). This probably means better case finding at the present time. Rejections for venereal disease constitute 1.6 per cent of men in the present examinations as compared with 0.5 per cent in the last draft. This higher percentage need not indicate an increase in the prevalence of venereal disease since 1918, but is probably due to more rigid standards today which exclude men with venereal disease and to the use of better diagnostic methods.

In spite of the higher percentage of rejections reported today than in 1917–1918, it cannot be said that the physical status of young men has deteriorated since the World War. Neither can it be said that the health of young men has

* Report of the Round Table on Health Problems in National Defense at the Nineteenth Annual Conference of the Milbank Fund.

improved. Differences in physical examination standards, in technic of examining physicians, and other factors make comparison difficult until the data can be analyzed in more detail. Rejections for defective teeth are obviously higher in 1941 than in 1918; otherwise, the important causes of rejection today are the same as those in the World War draft.

HEALTH ACTIVITIES NOW BEING CARRIED ON AS A RESULT OF DETECTION OF REPORTABLE DISEASES

Selective Service examinations offer an unusual opportunity of case finding on a wide scale. What is being done about newly discovered cases of two reportable diseases, tuberculosis and syphilis, was discussed by Dr. H. R. Edwards and by Dr. Theodore Rosenthal.

According to Dr. Edwards, army plans for examination of all men at the induction centers include a chest x-ray. All men showing evidence of reinfection tuberculosis, active or apparently arrested, are rejected.

The U. S. Public Health Service has urged that the Selective Service Boards, as well as army Induction Stations, set up a plan for the reporting of all cases of tuberculosis to the state or local department of health. Little information is available on the completeness with which this is being done. However, reporting of these cases is not being uniformly carried out throughout the country. In some cities, such as New York, and in certain states, the new cases are being reported and are vigorously followed by the department of health to insure proper medical supervision for each, whether it be care in a hospital, by a private physician, or in a health department clinic.

The method by which the New York City Health Department coöperates with the Selective Service Administration with respect to diagnosing cases of syphilis was described by Dr. Rosenthal. The serologic examination required of each registrant is made by the Health Department laboratory; and a report of the examination is sent to the Bureau of Social Hygiene of the Health Department, to the U. S. Public Health Service, and to the local board examiner. One hundred and thirteen thousand serologic tests have been made on selectees in New York City, and the positives have been about 2 per cent. Every registrant found to be positive is asked to report to his nearest health department clinic, and, if he is not under medical treatment, is immediately placed under treatment at the clinic, provided he is unable otherwise to secure medical care. All positive cases are given a second serologic examination. Intensive follow-up, first by mail, and if unsuccessful by home visit, is instituted on all registrants not reporting promptly.

On the basis of information recently given him, Dr. Rosenthal reported on the prevalence of syphilis in registrants from other parts of the country. In Ohio, among white registrants, the percentage was 1.8, and among the colored, 18. In Pennsylvania, among whites 1.3 per cent were positive, and among the colored, 17 per cent. Among 120,000 men, chiefly from the north central states, there were 7 infected men per 1,000. In two groups of southern states, the positives averaged 6 per cent and 11 per cent for whites and Negroes combined.

Neither tuberculosis nor syphilis is a leading cause of rejection; however, they are infectious diseases, both of which are subject to the hope of eradication. Scientific weapons against syphilis are available; certain procedures such as hospitalization in the control of tuberculosis are generally accepted. Case finding through Selective Service examinations should furnish impetus for organization on a national scale of campaigns against these diseases.

AVAILABLE MEASURES FOR PREVENTION AND CORRECTION OF IMPORTANT CAUSES OF REJECTION

The round table next turned to a discussion of a number of the important causes of rejections which are not reportable but represent significant health problems for which rehabilitation programs are being sought. Each disease or defect was considered with reference to measures now available for correction and to measures of prevention that are applicable to the young not yet affected.

The first condition discussed was defective teeth, and Dr. Henry Klein opened the discussion by presenting detailed data from careful mouth examinations of about 1,400 young men in West Virginia and Maryland in the age range 21 to 35 years. These men were classified according to Selective Service standards into "acceptables" and "rejectables." Dental needs found in the rejected were described as follows: 2.4 teeth per man were carious enough to require extraction; 7.6 tooth surfaces needed to be filled; and, because on the average 13 teeth have been extracted, 9 out of every 10 rejectables need full or partial dentures. The situation found at these ages, said Dr. Klein, arises from a long-continued accumulation of untreated caries which have been accruing each year since the men were about 6 years of age. A large disparity has long existed also between the rate of development of carious lesions and the rate at which these lesions have been serviced in these men. Knowledge is not sufficient for the prevention of caries, according to Dr. Klein, but procedures of dentistry are sufficient to prevent rejection for dental defects, even in men having marked caries susceptibility. With our present knowledge, a never-ending dental-servicing program is required, beginning in the first decade of life and continuing without interruption through the fourth decade or longer.

The findings in regard to dental defects naturally raised the question as to the value of a program for dental care of children after 6 years of age. It would appear that such care to be effective must be continuous; if there is a lapse, the increment of caries will exceed the increment of care. It was generally concluded that the evidence at hand did not indicate great accomplishment in the field of dental health during the past twenty years.

The discussion of prevention and correction of cardiovascular diseases was opened by Dr. Soma Weiss, who stated that it is essential to admit the limitations of our attack upon the problem. The majority of disturbances of the heart, blood vessels, and circulation are not easily prevented or cured, because most disturbances are structural, irreversible, and often degenerative, and their causes are not at present adequately understood. The greatest number of rejections in this class probably come from cases of rheumatic heart disease, arterial hypertension, and neurocirculatory asthenia.

The most hopeful approach to the problem of rheumatic heart disease lies in reducing the incidence of acute rheumatic fever and in treatment of patients with rheumatic activity. Further knowledge of its etiology is essential for an effective program of control. Studies in the large urban centers have indicated the association of rheumatic disease with overcrowding and poverty. Improvement of housing conditions, better diets, and a more healthful life would undoubtedly lower the incidence of this disease.

Arterial hypertension, said Dr. Weiss, is but a symptom of various abnormal conditions, among which one of the most important is lesions of the kidneys. Search should be made for a diagnosis of potentially curable unilateral renal disease. Considerable judgment must be used to determine the significance of moderate

hypertension, since in young adults moderate elevation under psychic stress is not unusual. The management of persons with hypertension consists of educating them in rational living in moderation. In neurocirculatory asthenia, psychic factors may play an important rôle, but the physiologic responses of the cardiovascular system and of the autonomic nervous system are congenitally suboptimal. Physical training which is slowly increased in intensity, combined with psychotherapy, can benefit these persons, but the condition usually cannot be cured. The only form of valvular heart disease which can be entirely prevented by treatment, according to Dr. Weiss, is syphilitic heart disease.

Rheumatic fever as a cause of heart disease was discussed by Dr. John R. Paul. Prevention of this disease is in its infancy, but there are encouraging signs that it may become a legitimate form of public health endeavor. According to Dr. Paul, there is already information that the rheumatic family is an important unit in the field of prevention of this disease, in the same manner as is evident in other chronic infectious diseases—namely, tuberculosis and syphilis. If a family (living in the vicinity of New York City) is chosen by virtue of the fact that one of its members (a child) is rheumatic, then the chances are that 10 per cent of the other siblings are also rheumatic. If a family is chosen because one child and one parent are rheumatic, then about 20 per cent of the other siblings will prove to be rheumatic. This indicates the importance of the family as a unit upon which preventive efforts in this disease may begin.

Another line of approach is through the schools, for this disease is one which primarily attacks individuals of school age (7–13 years), and the proper examination of school children would go far in promoting more adequate systems of case finding and more adequate contact with the rheumatic family. A *Register* of rheumatic cases is another important need.

Just how far the early rheumatic or the "pre-rheumatic" child may be safeguarded is, of course, open to question, but the preliminary reports on the use of small doses of sulfanilamide as a control measure in this disease are sufficiently interesting to warrant its further investigation as a possible public health weapon.

Prevention and correction of eye defects was discussed by Dr. H. S. Gradle. Among persons examined by Selective Service, slightly over 5 per cent are disqualified because of eye conditions. Three-fourths of these are due to defects in refraction and in vision, and less than one-fourth because of ocular disease. Refitting these individuals for service is a simple problem, provided a certain compulsory element is added. In Dr. Gradle's opinion 82 per cent of those rejected for ocular conditions can be rehabilitated. As yet, there is no way of enforcing rehabilitation and the problem of rehabilitation hinges upon the one factor as to whether it is to be voluntary or compulsory.

Dr. Gradle felt that with the enormous man power which we have to draw upon for our present army, it does not matter whether we throw three or four hundred thousand men out who might go into the service, but it does make a difference in the industrial and economic future of the country as to whether the young men of that generation will be put into the best possible physical condition.

He noted that the uncorrected visual defects increase perceptibly as age increases. For example, in a survey of about one million and a quarter children in the primary schools, defective vision was found in about 0.9 per cent of the pupils. At high-school ages, the rate was almost 2 per cent; and for the ages which are being dealt with in Selective Service examinations, the rate increased to 3.5 per cent.

It was found in the school surveys that the correction program, when undertaken, had marked effects upon the well-being of the children, and it is believed that the same will hold true in the Selective Service cases if they are rehabilitated from the visual standpoint.

Dr. A. L. Van Horn, who reported on orthopedic impairments, stated that conditions in this class accounted for 7 per cent of rejections and was exceeded only by defective teeth. Orthopedic impairments generally are the result either of accident or of disease. The diagnoses for 150,000 crippled children indicated that impairment in about 19 per cent is due to poliomyelitis, in 11 per cent to cerebral palsy, in 7 per cent to clubfoot, in 6 per cent to osteomyelitis, and in 5 per cent to flat-foot.

A large part of the severe crippling conditions resulting from poliomyelitis can be prevented in instituting proper therapeutic measures as soon as the diagnosis has been established. Recent advances have been made in the treatment of acute osteomyelitis with the newer chemotherapeutic agents which offer considerable encouragement. Early diagnosis and treatment is of extreme importance. Many congenital deformities can be effectively treated in early childhood to the point where normal function can be assured in many instances.

Flat-foot, when recognized early, may respond to certain training exercises. Mild or even moderate degrees of flat-foot are not inconsistent, however, with a proper functioning foot. Curvature of the spine, another frequent cause for rejection under the Selective Training and Service Act, can best be treated in its earliest stages. A severe or even moderate degree of deformity due to scoliosis is rarely consistent with normal function.

According to Dr. Van Horn, prevention is the only reasonable and satisfactory solution for impairments due to accidents. Elimination or control of industrial hazards will play an important part in this program. Continued emphasis must be given to traffic control, to improved highways, and to education of the public regarding the prevention of accidents.

In order to provide our armed forces with men who are physically fit and also to fill the needs in our defense industries, serious consideration should be given to a comprehensive program of physical rehabilitation whereby full utilization of our existing man power can be realized.

Special consideration should also be given to provisions for vocational training and for placement of physically handicapped persons in defense industries. More emphasis has generally been placed on the correction of the physical disability than on the elimination, in so far as possible, of the vocational handicap. Any program of physical rehabilitation without subsequent vocational training and placement of the physically handicapped fails to meet fully the needs of this group.

Dr. Currier McEwen commented that, even though arthritis has been found relatively infrequently among the men examined through Selective Service, it is, when present, a leading cause of disability. Though small in number, these cases are important also because many of them cannot be made available for military service. Dr. McEwen pointed out that the feasibility of prevention and correction of arthritic defects would depend on the nature and particular form of disease in question. In the pyogenic forms of arthritis, those due to known infectional causes, modern treatment with chemotherapeutic agents is very promising.

The mental and nervous diseases for which men are excluded from military

training run the gamut of all neurologic and psychiatric disturbances, said Dr. John Romano. As conducted in Boston, the neuropsychiatric examination is made by a psychiatrist at the induction center and each man is seen for about six minutes. It consists of an examination of the cranial nerves, reflexes, gait, coördination, Romberg, etc., and attention to signs of nervous tension and disorders. Questions are asked on history of employment, relationships to family and fellow employees, history of alcoholism, stammering, nervousness, fainting. The responses to questions usually give indication of intelligence but some few are referred for an intelligence test. Rejections have averaged from 8 to 12 per cent. The principal causes, said Dr. Romano, have been occasional neurologic disorders, limited intellectual endowment, and a third group with character disorders or psychopathic personalities associated with minor thefts and chronic alcoholism. Finally, there is the important group of neurotic individuals: fainters, stammerers, and those with pronounced nervous instability who are fertile soil for the traumatic neuroses. Dr. Romano was of the opinion that, if possible, more time should be given to the psychiatric examination in order to exclude neurotic personalities who may do poorly in military life but who may adjust to other phases of the defense program.

Though much has been accomplished by the mental hygiene movement during the past thirty years, Dr. Romano felt that there still is a great deal of work to be done in respect to popular education in the family, the school, industry, and the medical profession in order to remove the stigmatization which still exists in respect to emotional problems. It is most desirable to have an increased awareness on the part of physicians of the significance of emotional illness and of neurotic personalities with or without physical disease. Without this, the problem of prevention will remain insoluble for many years to come.

Dr. H. E. Meleney mentioned the possibilities of wider application of preventive health measures which were brought out by those participating in the discussion. He emphasized again the need for extension of present programs in the control of tuberculosis and syphilis, and the need to determine the cause of dental caries. Dr. Meleney also advocated the reporting of rheumatic fever as a public health measure.

Popular education concerning psychiatric conditions was stressed in his summary. The need for specific classification of diagnoses of these conditions which was suggested by Dr. Kenneth F. Maxcy was also noted. Dr. Meleney commented on the probability that war itself and the strain of service had been a great cause of post-war disability in persons probably normal before going through the experience. For prevention, a quick screening test and a later examination might be suitable.

POSSIBLE PLANS FOR REHABILITATION

Mr. Linton B. Swift explained the plan to establish information centers in communities throughout the country where local draft boards may send men for advice on health, personal, and family problems. The plan has been worked out by the Family Welfare Association of America in coöperation with the National Selective Service System. Local member agencies of the Welfare Association are to conduct the information centers which will direct men, rejected or deferred because of disease, physical defects, or other problems, to the health agencies, clinics, public welfare departments, and private family agencies in their community. Coöperation, Mr. Swift explained, is entirely voluntary on the part of all persons and organizations concerned.

Further information than that available in the routine operation of Selective Service is necessary, if programs of rehabilitation are to be planned wisely and if the lessons of these data are to be fully applied in shaping our future health services.

Mr. Perrott suggested an experimental project in several localities to determine:

1. The extent to which specific defects among these men might have been prevented or ameliorated if adequate health and medical services had been received during childhood and adolescence.
2. The relation of the defects to the men's civil occupations, and the possible need for vocational as well as medical rehabilitation.
3. The degree to which various defects might be remedied by appropriate medical and surgical procedures; this estimate should be made by specialists.
4. The value of an experimental rehabilitation of young men who voluntarily agree to undergo treatment. This would give information as to the practicability of a voluntary program, cost of necessary treatment, and effectiveness in improving the physical status of the young men, both from the point of view of their availability for military service and their effectiveness in civilian occupations.

It was pointed out in the group discussion that most conditions which need correction are not reportable and are by law confidential information which is not revealed except to the individual concerned.

Dr. George Baehr, in summarizing the topic of rehabilitation, said that everybody has been so impressed with the number of remediable physical disabilities among the 42 per cent of registrants who have been rejected by the combined Selective Service and Induction Boards, that the public press and our legislative officials have become conscious of the problem and of its significance. For this reason, the Health and Medical Committee, which is a part of the Federal Security Agency, and the Honorable Paul V. McNutt, Coördinator of Health, Welfare and Related Defense Activities, appointed a Commission on Physical Rehabilitation of the Rejected Registrants, of which Dr. Baehr is chairman. Three other members of the Commission—Dr. H. S. Gradle and Dr. M. T. MacEachern of Chicago, and Dr. Channing Frothingham of Boston—attended the round table conference. At a recent meeting of this Commission, it was decided to recommend that the examining physician of the local Selective Service Board and of the Induction Board, when noting a defect, should state whether in his opinion the condition is correctable. A second suggestion was that the registrant, if he wishes, should sign a statement that if a remedial defect is found he will have it corrected. This might have the effect of persuading the registrants to have something done about defects when they are discovered.

Some members of the commission feel that some compulsion is necessary. Others feel that a combination of compulsion and persuasion will be required. Some men could be inducted into the army where minor handicaps can be corrected. Whatever means is found to raise the consciousness of the people themselves concerning the magnitude of this problem and the need for action, one thing must be done—funds must be found to meet that cost. State and local agencies will meet the problem realistically only when they know the actual extent of the problem and how much such a program for correction will cost.

In considering plans for rehabilitation of rejected persons, Mr. Homer Folks made the observation that at the present time there is not much machinery available for corrective work for this particular group. In a practicable plan there must be funds to follow the man where the remedial work can be done. A

workable program must be state-wide, funds must have central allocation; this means action by the state.

The discussion of rehabilitation brought out the desirability of giving broad consideration to each individual which should include his social setting and normal environment. The mental and emotional states, the personal and social problems, and the potentialities of each individual require evaluation as well as his physical status if rehabilitation is to be economically and socially effective.

NUTRITION IN NATIONAL DEFENSE*

FRANK G. BOUDREAU, M.D., *Chairman*

HUMAN resources are the one essential to a nation's defense for which there is no "ersatz." Indeed, the success of military and production activities for defense rests heavily on the health and morale of the people. In turn, it is equally true that their health and morale depend in large part on their being well fed according to modern standards.

Investigations over the past thirty years have revealed the existence of many dietary essentials and the foods which contain them; the nation's farms can easily supply all the food required. Advances in the science of nutrition have revealed the nature of specific deficiency diseases and now, for some, even the mildest form can be detected; the specific essentials are also available in pure form as therapeutic agents. Thus, we have the knowledge and means both to correct our outstanding nutritional deficiencies and to insure good nutrition.

The Round Table on Nutrition in National Defense considered the requirements for proper feeding of the population and discussed plans for national organization and activities to promote the widest possible utilization of the science of nutrition and our vast food resources, in the larger perspective of existing conditions and activities in other liberty loving countries.

From his own survey last autumn as well as from very recent reports supplied by six other observers, Dr. Joseph Stokes, Jr., described the dietary conditions in warring and occupied countries of Europe.

In France last September an ersatz product was being used to supplement a dwindling meat supply; a shortage was impending in potatoes, vegetables, and sugar; and there was an almost complete lack of fat. The principal vitamin deficiencies were of A and the B complex.

Very recent information from Norway indicates that the population in the northern part of the country, though small in number, was undergoing particularly severe privation because lack of fuel had resulted in most of its potato crop being frozen. Elsewhere in the country, bread, sugar, and fats are rationed; milk is available only in reduced amounts; and vegetables are scarce. Although the amount of fish is sufficient, the quantity of bread and milk depends upon imports which will have to come in far larger quantities if there is not to be definite starvation very soon.

Dr. Stokes presented comparative data on daily rations in six European countries as obtained from ration cards. Denmark, Italy, and Germany are enduring less hardship from want of food than are Belgium, Holland, and France. It is estimated that the population in the latter countries is receiving at most, 1,400 to 1,500 calories a day, with the actual figure probably much closer to 1,100. Unoccupied France is said to be in somewhat more serious straits than the occupied area.

---

* Report of the Round Table on Nutrition in National Defense at the Nineteenth Annual Conference of the Milbank Memorial Fund.

Both Dr. Stokes and Dr. Wilbur Sawyer agreed that food shortage was severest in Spain. Those who have attempted to estimate the daily caloric intake there have put it between 800 and 900 calories for adults. And throughout the population there were marked physical signs of malnutrition.

WAR EXPANDS NUTRITION WORK IN CANADA

Describing the recent nutrition work in Canada, carried on principally by five agencies, both official and nonofficial, Dr. F. F. Tisdall stated that the program is now being pushed with greater scope and vigor than ever before. For with the outbreak of war, the need was at once recognized to expand rather than restrict nutrition activities.

Besides directing the attention of the Canadian people to the importance of nutrition through a series of public addresses by outstanding authorities, the Canadian Medical Association, with the assistance of the Life Insurance Companies in Canada, has prepared a booklet, *What to Eat to Be Healthy,* of which one and one-quarter millions have been distributed. It is now in its third printing. In conjunction with the Canadian Red Cross, the Medical Association has published another booklet, *Food for Health in Peace and War,* of which one and three-quarter million copies have already been given out and an additional three-quarters of a million are to be issued. This number will provide a copy for every home.

Indicating that research has also gone forward in Canada, Dr. Tisdall reported some results from an experimental demonstration at the Toronto General Hospital on the beneficial effects of improving the diets of pregnant women. Of 200 women attending the prenatal clinic who were found to have poor diets, 100 were given daily supplemental food which included: one egg, 30 ounces of milk, one-half ounce wheat germ, one ounce cheese, four and a half ounces of canned tomatoes, and one orange. The remaining 100 women received no supplements. The obstetricians recorded their findings for all the women and were not told which had received the supplements. In the improved-diet group, there were no miscarriages, stillbirths, or deaths of infants in the first 6 months of life; in the poor-diet group there were 13 per cent. Major complications during labor affected 17 per cent in the supplemented group as compared with 47 per cent in the poor-diet group. Postpartum complications showed similar differences in incidence and furthermore the babies showed a striking difference in their condition during the first 6 months of life.

Another type of research pertained to the analysis of foods extensively used in Canada. This work has indicated that vitamin C is not abundantly distributed in many Canadian foods. This, combined with the loss which occurs in vegetables in cold storage, suggests that vitamin C may be an important deficiency in the Canadian winter diet.

Dr. E. W. McHenry stated that the Department of Pensions and National Health, through its Council on Nutrition, has conducted nutritional surveys on low-income groups in Halifax, Quebec, and Edmonton; and on a middle-income group in Toronto. The results of the low-income surveys were entirely similar in the different cities. They pointed to three principal deficiencies: the vitamin B complex; calcium, particularly in children; and iron, particularly in women and children. It was found that the shortage of the vitamin B complex also occurred in the high-income group, although it was not as marked as in the low-income families. Calcium deficiency was present among the adolescent girls in the

high-income group. These girls were consuming very little milk because they were endeavoring to remain slender and regarded milk as a fattening food. Interestingly, enough, they were actually consuming about 20 per cent more calories than they required, most of it coming from pastry, candy, and soft drinks.

Because of the low thiamin intake revealed by those surveys, the health and agricultural authorities in Canada have been studying the production of wheats with high thiamin content and special milling processes to retain most of this vitamin.

ADEQUATE FOOD SUPPLY STRESSED IN DEFENSE WORK OF THE UNITED STATES

In the United States it is recognized by agricultural and public health officials that adequate supplies of the right kind of food are an important part of the "total" defense work in which our country is now engaged. Mr. M. L. Wilson reported to the conference on natural food supplies in their relation to a number of important government programs. Referring to the current wheat surplus in the United States and in the world, he pointed out the importance of continuing acreage adjustment of wheat. Concerning the food-for-defense program, he cited a recent important measure by the Secretary of Agriculture to stimulate the conversion of corn and feed crops into protective foods, like pork, eggs, and dairy products. The program provides for the long-term support of prices for the latter products. A program to expand production of canned tomatoes has also been announced and other commodities probably will be added to the list.

The need today, said Mr. Wilson, is for more protective foods and for getting more of these to the population as a whole. Many persons can be reached through education. But several millions of our lowest income families actually lack the buying power to get the foods they need.

For some time a surplus in farm products has been a troublesome economic problem. Accordingly, the U. S. Department of Agriculture has initiated programs enabling the underfed to consume the surplus. Mr. Wilson described one plan by which food stamps have been used to insure that the consumption of surplus foods would represent an actual net increase in food intake. Its benefits, at first restricted to those on relief, were recently extended to others receiving public assistance. The plan is now operating in 380 different areas throughout the United States.

Utilization of surplus foods in the free school lunches represents another beneficial outlet for these foods. Through the coöperation of federal, state, and civic organizations, this service is now providing at least one satisfactory meal every school day for five million children. Also, a special low-cost milk program is being tried out in six large cities. Public-aid families are able to get milk at 5 cents a quart, or free if local welfare agencies can arrange for free distribution. Supplementing the low-cost milk program, special provisions make possible the sale of milk to school children at a cent a glass.

Educational programs to stimulate farmers to have gardens and to grow more protective foods have been carried on for years by the Agricultural Extension Service. This work has been extended in the past year.

Plans for improving the nutrition of our population are progressing on a wide front. The Federal Coördinator of Health and Welfare has set up an office of nutrition as a clearing-house for the state committees on nutrition. He is advised by an important committee composed of representatives of government agencies concerned with health and nutrition. On a lower but not less important level

are the more than forty state nutrition committees which in some instances are duplicated in counties and towns.

In December, 1940, the National Research Council announced the appointment of two committees—the one on Food Habits, the other on Food and Nutrition—to advise the United States Government on nutritional aspects of national defense. The Committee on Food Habits has been hearing results from scientific studies on food habits. The Committee on Food and Nutrition has been active in matters pertaining to the public health aspects of nutrition. It has also functioned through seven subcommittees, of which three may be mentioned here: Subcommittee on Definition and Standards for a Nutritionally Satisfactory Bread, Subcommittee on Basic Concepts of Nutrition, and Subcommittee on Nutrition in Industry.

ENRICHED FLOUR AND BREAD RECOMMENDED AS NATIONAL MEASURE

After considerable study, the Subcommittee on Definition and Standards for a Nutritionally Satisfactory Bread recommended that a new flour and bread enriched in vitamins and minerals should be produced in this country. These would contain thiamin, riboflavin, nicotinic acid, possibly other ingredients of the B complex, and iron in amounts corresponding to or greater than those in stone-ground flour from high vitamin quality wheat. Although the relevant recommendations of the Food and Drug Administration defining enriched flour and bread have not yet come into force, such flour and bread have been made available by the millers and bakers almost everywhere throughout the country.

Dr. Russell M. Wilder explained the rationale underlying the recommendation on enrichment of flour and bread. For various reasons the trend in the milling industry has long been toward increasing refinement of flour with a corresponding loss in its nutritive value. But, since bread from such flour is a staple article in the American diet, indeed, represents a large part of the food of the low-income group; since its deficiencies are often not compensated by other items; and since its high starch content actually creates a drain on what little amount of the vitamin B complex there may be in the rest of the diet; the committee deemed it advisable to restore at least part of its natural nutritive properties as a means of conferring some protection on the mass of the population.

"Enriched flour" may be produced either by a change in the milling or by simple addition of the specified essentials. "Enriched bread" may be made from "enriched flour," or by the addition of the required vitamins and iron to the bakers' formulae, or by the use of special yeasts. Thus, it is not specified that enrichment need necessarily be by addition of the synthetic vitamins.

It is apparent that the "enriched" bread, eaten in the usual quantity will assist importantly in planning an adequate diet. Its use will be of most help to those who customarily rely upon bread as their main source of energy.

In view of these measures taken in behalf of the civil population, Col. Paul E. Howe was asked about the army ration. He stated that the army has been operating its messes on a money allowance based on the garrison ration; but that in May, 1941, the soldiers would begin to receive definite quantities of food corresponding to a set of monthly menus. The slight saving under this plan is to be spent for food supplements.

Dr. Lydia Roberts reviewed the work of the Subcommittee on Basic Concepts of Nutrition in its preparation and adoption of standards for various dietary essentials. In view of the lack of precise experimental evidence on the require-

ments for the several constituents, they asked many nutrition investigators for suggestions of values which had the best bases. Before their adoption the proposed allowances were submitted to the investigators for criticism. Dr. Roberts made a plea for intensive studies on the quantitative needs for the several dietary essentials so that the values might be more exactly fixed. Similarly, Dr. C. G. King urged further investigations on the amounts of the essentials contained in various foods.

The Subcommittee on Nutrition in Industry has adopted a report drawing attention to the importance of good nutrition for defense workers and recommending measures for the study and promotion of such nutrition. It was pointed out that the defense of this country rests upon defense workers concerned with production of the instruments of defense just as it rests on the effectiveness of the armed forces. Yet candidates for the armed forces are rigidly selected and given every environmental and nutritional advantage, while defense workers, many of whom have been rejected for military service, must as a rule shift for themselves. The recommendations of the subcommittee have been endorsed by the Subcommittee on Industrial Hygiene of the Health and Medical Committee of the Council on National Defense.

CORRECTION OF MALNUTRITION AMONG INDUSTRIAL WORKERS IS NEEDED

Designating it an urgent problem, Dr. V. P. Sydenstricker stressed the need for correction of existing malnutrition among the civil population, particularly the industrial workers. He pointed out that the nutritive system is labile, reacting readily to numerous adverse factors. Of these, insufficient or improper diet is the commonest. In times of plenty, the national diet is not exemplary. During economic depression, it is much inferior and presents a real problem. The result is malnutrition on a mass scale.

Furthermore, it should not be forgotten that nutritional disturbances arise from many possible causes beside improper diet. For example, most intercurrent illnesses leave their mark upon the nutritive system.

As yet, the exact amount of malnutrition cannot be stated; estimates vary from 25 to 50 per cent of the population. Even in better times it is a problem which extends through the population; for malnutrition is no respecter of age, sex, or locality. But now it has been magnified and intensified by economic circumstances of the past decade, particularly among the less fortunate. The best evidence from dietary surveys and nutritional examinations indicates that a large proportion of those who have been existing on extremely low incomes, comparable to levels provided in various forms of public assistance, have been subsisting on inferior diets and bear the unmistakable signs of malnutrition.

This malnutrition is deeply significant in this hour of industrial mobilization. As the call goes out for the unemployed to rejoin the ranks of labor, it should be recognized that many who return will show the effects of prolonged dietary deprivation and periodic illness. In the interest of efficiency, it is already appreciated that many will require a training period to regain lost skills. But efficiency is also linked with physical condition. That part of the body most profoundly affected during times of privation and therefore most urgently needing restoration is the nutritive system.

Nutritive disturbance, depending on the cause, assumes many forms. Deficiency diseases are usually multiple just as dietary deficiences are multiple. They also appear in various degrees of severity, in which the mildest is the latent state.

There is every indication that much of the present malnutrition in this country is in this state. In the nutritive rehabilitation of persons, on a large scale, the first task is to detect the malnourished and the nature of their deficiencies. For this purpose, a battery of new methods is now available.

Once the affected persons and the nature of their deficiencies are identified, it is desirable that their nutritive system be restored as quickly as possible. Obviously, any dietary defects must be rectified. In the past, it has been thought that an adequate diet will correct any nutritive disturbance. This remains true, but it is not the whole truth. If time is no consideration, a satisfactory diet will doubtless lead to recovery; but it may not bring about complete restoration with promptness. The malnourished present pathological conditions which call for specific therapy in higher concentration than can be provided in food. In short, in addition to a satisfactory diet, concentrates are needed for rapid recovery. Once recovery is accomplished, the therapy may be withdrawn and diet relied upon for maintenance.

PLAN OF POPULAR EDUCATION IN DIET IS URGED

In discussing education in diet and nutrition, Dr. Lydia Roberts emphasized the pressing need at the present time for existing knowledge to be incorporated more widely into the living of the people. The task is to devise ways and means to speed up this process so that the population at large may profit from their rich inheritance in the results of nutrition research. The solution must come largely through a well organized plan of popular education. Dr. Roberts mentioned three aspects of such a program:

1. Translating the findings of research into everyday terms which the lay person can understand.
2. Broadcasting this knowledge in every possible means so that it reaches every person in the country.
3. Devising effective ways of motivating the common people so that they are convinced that nutrition does "make a difference," and feel the "inner urge" to put it into practice in their living.

The methods by which these ends may be accomplished were discussed under two main heads: (1) generalized education of adults and children through a variety of "shot-gun" methods, and (2) fundamental education in the schools and higher institutions of learning.

General education, said Dr. Roberts, means deliberately entering into the fields now largely usurped by commercial interests, and using them for public welfare. The time has come when some organization interested in public welfare rather than commercial profit should take over the air and broadcast sound nutrition education to the public. It should study the programs and methods of the most successful commercial broadcasts and incorporate into its own program their essential features. Other avenues of nutrition education which should be utilized are food demonstrations, adult education classes, and dissemination of nutrition facts through leaflets and posters in places where people assemble, such as grocery stores, school lunchrooms, industrial plants, relief stations, clinics, waiting rooms of railway stations, and elsewhere.

But such methods, even if effective, are only second best. Dr. Roberts felt that the real hope for improving dietary habits and nutritional status is through a fundamental program of education, especially in the public school. Few schools have effective nutrition programs, due largely to the lack of nutrition knowledge

on the part of the teachers. The greatest need at the present time, therefore, is to include education in nutrition and related health matters in every institution which trains teachers.

From the many reports and views presented at the Round Table it is apparent that, although much is being done to improve the nutrition of our people, much remains to be accomplished. The view was expressed that a well-organized national effort on a broad front to direct and coördinate the activities of the many existing agencies toward raising the nutritional level of the people and, thereby, their efficiency and vitality would enhance our national strength in the present emergency. For this the many organizations are laying plans. Their activities are expected to take fresh impetus from the National Nutrition Conference called by the President.

RESEARCH IN FACTORS INFLUENCING FERTILITY*

LOWELL J. REED, PH.D., *Chairman*

PROBLEMS of the quantity and quality of population are basic to considerations of national defense. Matters of immediate concern are numbers of males of military age, and proportions of these fit for military service. If we think in terms of permanent defenses, we inevitably give attention to the size and character of future generations, hence to the birth rate and its variations in different elements of our population.

Just at the time that this country was becoming sufficiently aroused to adopt a Selective Service Act, it was also learning from the 1940 Census returns that the numerical increase in population during 1930–1940 was smaller than that for any decade since that of the Civil War. The proportionate increase, 7.2 per cent, was by far the smallest for any ten-year period since the first census was taken in 1790.

It is, therefore, not surprising that there is increasing popular concern over the trend of the birth rate. Herein lies some danger that a hastily conceived and one-sided population policy will be demanded. Careful students realize that the problem is not amenable to simple and uniform treatment, and that much additional knowledge is needed. There are the contrasting situations of low birth rates among certain urban groups and high birth rates in rural areas, particularly in the socially neglected and economically handicapped regions of the South. Thus, for urban groups the focal problem in population policy might be that of encouraging larger families. Before this problem can be attacked with confidence, however, a better understanding is needed of the cultural and psychological factors influencing human fertility. In certain rural areas, problems of health, education, and poverty are accompaniments of high fertility; and one of the outstanding questions is the most feasible way of making family limitation available to people needing it for health or economic reasons.

The program for the Round Table on Population Studies was prepared with the above points in mind. The general topic was "Research in Factors Influencing Fertility." Reports of six research projects in varying stages of progress were presented for discussion. Those at the morning session were concerned mainly with urban problems of low fertility; those at the afternoon session centered chiefly around rural problems of high fertility.

In the first report, Professor P. K. Whelpton described the purpose and method of a coöperative study of social and psychological factors affecting fertility. This study is being made under the auspices of the Milbank Memorial Fund, with grants from the Carnegie Corporation of New York. The plans for it were developed during the past two years by a committee of ten students of population and psychology.

The study has scientific as well as immediately practical aspects. Students of

* Report of the Round Table on Population Studies at the Nineteenth Annual Conference of the Milbank Memorial Fund.

population have long stressed the need for experimental studies of motivations and attitudes regarding the voluntary regulation of family size. The type of knowledge sought in this investigation is the kind that is basic to the development of any sound program designed to exercise social influence on size of family. Among other things, the study should shed some light on the relation to size of family of such factors as the cost of rearing and educating children, the struggle to achieve a higher standard of living, the feeling of economic security, personal freedom, group conditioning, interest in religion, personal adequacy, marital adjustment, and the like.

It is evident that a study of this type necessitates the collection of detailed information of a highly personal character. Interview and questionnaire forms have been prepared during the past two years. The process of developing them has been one of formulation, testing in field trials, revision, and retesting. The final forms were recently printed and the field work is now in progress under the direction of Professor Whelpton. The interviewers are nine women carefully chosen on the basis of education, family survey experience, and other qualifications.

In view of the detailed nature of the questionnaire, the sample will be a fairly small one. It is to be restricted to 1,200 married couples in Indianapolis with the following characteristics: husband and wife native white; both Protestant; married in 1927, 1928, or 1929; residents of a city most of the time since marriage; wife under 30 and husband under 40 at marriage; neither previously married; both elementary school graduates; neither known to be sterile during most of the time since marriage. These restrictions are being imposed in order to maintain a sample which will be sufficiently large and homogeneous to permit statistical analyses of psychological data. The native-white, urban Protestant group was chosen because it is characterized by low fertility levels toward which birth rates of other population elements are believed to be approaching.

The discussion of the report went into the methodological reasons for restricting the study to the group under consideration. The hope was expressed that similar studies might be made of other population groups, in order that the urban-rural and religious influences might be more fully understood.

Through a coöperative arrangement with the United States Public Health Service, analyses of fertility data collected by the National Health Survey are being made by the Milbank Memorial Fund. A progress report on this work was presented by Dr. Clyde V. Kiser. It related to some 284,000 native-white married women of childbearing age, and considered variations in birth rates *within* as well as *between* broad social classes. Within each of four occupational groups birth rates were related to income and to education.

The report was focused on the relative importance of the various factors considered. The provisional interpretation was that birth rates of the surveyed women were more closely associated with amount of family income than with occupational class of the head, or with educational attainment of the wife. The usual tendency for birth rates to rise with lowering of occupational class was not found within specific income groups above the $1,000 level. It was emphasized, however, that certain characteristics of the *Survey* data necessitate important qualifications regarding the closer association of birth rates to income. It was explained that, whereas the index of fertility and that of income both related to an identical period, the depression year of 1935, the occupational classification was based upon the *usual* status of the family head, regardless of his occupational or employment

status at the time of the *Survey;* and educational attainment of the wife was based upon the accomplished fact of school attendance. Hence, different results might have been secured if the index of fertility had related to total number of children ever born, or if the *Survey* had been conducted during a nondepression period.

Dr. Kiser also pointed out that since income related to the total family, certain selective factors doubtless accompanied the cross-classification by occupation and income. Available tests indicated that within groups of high and moderately high family income, lowering of occupational status was accompanied by systematic increases in proportions of families with wives gainfully employed, with relatives in residence, and with the couple constituting a secondary family. Since these selections appeared to carry with them selections with respect to low fertility, the direction of their influence would be toward the effacement of any actual inverse relation between birth rates and occupational class at high and moderately high income levels.

In the discussion it was stated that the occupational classes used in the study were possibly less homogeneous in their make-up than were the income classes, and that this might also help to account for the apparent closer association of birth rates to income. The hope was expressed that some further light on the relation of birth rates to various factors would be available from analyses based upon 1940 Census data.

Mr. Dudley Kirk, of the Office of Population Research at Princeton University, reported on a study of employment levels and birth rates, with special reference to Germany. The purpose of the study is twofold: (1) to investigate the general relationship of employment levels to birth rates in recent years, and (2) to appraise the influence of reëmployment in the rise of the German birth rate since 1933.

For the first and more general purpose, indices of employment and births were compared and correlated. Detailed computations for Germany were made for the period from 1923 to 1940, and similar computations for other countries (including the United States) covered the past decade. Experimentation with the time-series technique revealed that the highest correlations were achieved by lagging births nine months behind employment. In other words, the correlation was highest when the analysis was referred to the date of conception rather than to the date of birth.

It was found that there has generally been a high correlation between employment levels and births in Germany. This was most marked in shorter periods of time, but when the secular trend of births was eliminated there was also a high correlation over the longer series. The correlation was higher in the recent periods than in the earlier ones, and was higher in the urban than in the rural regions of Germany. It was high in periods of both rising and declining employment, and there seems to be no reason for supposing that it was much greater in the latter than in the former.

In investigating the same question for a variety of countries, the correlation between employment and births was found to increase markedly with the degree of industrialization.

An interesting hypothesis developed by Mr. Kirk was that a large part of the rise in German births after 1933 was attributable to reëmployment in the National Socialist "construction" program, and that reëmployment was a more important factor than any specific National Socialist population policy. The changes in

employment levels and birth rates between 1932–1933 and 1938–1939 in the several countries of Western Europe demographically comparable to Germany suggested that a large increase in birth rates in Germany might well have occurred on the basis of reëmployment alone.

In the discussion, Dr. David V. Glass suggested that the maintenance of a high correlation between employment and births seemed somewhat unexpected, for from the end of 1937 the initial National Socialist policy of driving women back into the home was replaced by one of encouraging the gainful employment of women. He pointed out that, although reëmployment was undoubtedly very important in influencing the trend of the German birth rates, many developments of the Nazi regime had impinged on the birth rate. The more stringent enforcement of abortion laws and the suppression of birth control clinics constituted one factor. In addition, under the controlled economy, it is difficult for the ordinary family to achieve status by any other way than raising a large number of children. For the ordinary family, the alternatives between having children and spending for conspicuous consumption were now even less available than formerly. The general discussion, however, emphasized that Mr. Kirk's finding was probably a fundamental one and was not peculiar to a particular social structure. If this is true, programs directed to securing full employment may be more important in maintaining the level of the birth rate in the short run than specifically formulated population policies.

The afternoon session, devoted mainly to problems of high birth rates in the rural South, began with Dr. Rupert B. Vance's report, "The Regional Approach to the Study of High Fertility." Dr. Vance discussed the demographic and cultural factors involved in the high birth rates in the Southeast. In part, the crude birth rate in the total Southeast is higher than in the remainder of the nation because of differences in composition of the population. To what extent, then, do the people of the region have a higher birth rate because they are more rural, because they are younger, and because of their racial composition? According to Dr. Vance, these combined factors account for less than half of the excess fertility in the Southeast. In other words, over half of the area's extra fertility is due simply to the tendency of women in the area to have more children irrespective of differences in racial, rural-urban, or age composition.

A direct factor in the higher specific fertility of the region is the infrequent practice of family limitation. In this connection, however, Dr. Vance agreed with Stix and Notestein in thinking that "the situation will not be rapidly altered merely by making modern contraception available to populations that have not used the folkway methods at their disposal. There must also be the will to reduce fertility."[1]

The need was therefore emphasized for studies of the culture complex of high fertility areas, of the values and attitudes of the group. It was suggested that the lack of will to reduce size of family may often be a corollary of the lack of incentive to improve level of living. The strain toward a higher standard of living is frequently cited by students as a reason for family limitation in our modern urban money economy. But the subsistence areas of the Appalachians and the "furnish and credit" system of southern tenancy areas have remained largely outside the cash nexus of our money economy. Cash costs of childbirth are small, and little is done for children. As stated by Dr. Vance, "deferred payments and do-without enter largely into the lower level of living which creeps with less evident calculation upon the growing family in subsistence areas."

Dr. Vance believed, however, that the gradual extension of high school education in these areas might serve to instill desires for a more adequate life and thus eventually furnish the motivation for restricting size of family. He also thought that a public health program devoted to the diffusion of better prenatal and obstetric care, if at all implemented in economic terms, might do much to raise standards and lower fertility among folk groups in problem areas of the South.

In the two final papers, Mr. Gilbert W. Beebe and Dr. Regine K. Stix reported on two different types of contraceptive service in southern areas of high fertility. Mr. Beebe described a three-year study among rural-nonfarm coal miners in Logan County, W. Va. Sponsored by the National Committee on Maternal Health and the Friends Service Committee, and approved by the local medical society, the service offered contraception to all married women of reproductive age. A trained public health nurse visited homes and gave contraceptive jelly to each interested woman. The service was accepted by one out of three married women, and Mr. Beebe reported that elsewhere in the Southern Appalachians an even higher rate of acceptance had been found. During the period of study the high fertility of the enlisted cases declined about 40 per cent, and it was estimated that extension of the service to all interested women might have resulted in a 20 per cent reduction in the county birth rate for a brief period.

Mr. Beebe commented on the rapidity with which patients dropped out of the series and concluded that a more successful service would require a more intensive follow-up and a variety of methods rather than a single one. He pointed out, however, that the costs of such intensive service, especially if operated independently of existing public health services, are too high to be met from public health appropriations in the Southeast, and that an unrestricted contraceptive service would be economically feasible only if integration with other public health activities permitted substantial savings, or if it were financed by other means.

Dr. Stix reported on the first three years of service of the Spartanburg County, S. C., Maternal Health Clinic, which operates under the supervision of the County Health Department in the Spartanburg General Hospital. It is a therapeutic service for patients referred by county health nurses, by physicians, or from other hospital services, because of illness contraindicating pregnancy. The clinic is operated by a physician, and while there is some flexibility in the types of contraception prescribed, the majority of patients whose records were studied were given occlusive rubber diaphragms and jelly.

Dr. Stix compared the two types of services with respect to cost, effectiveness, and acceptability. She concluded that, while the house-to-house service reached a larger proportion of the women in the area than the clinic could hope to reach, the per capita cost of the clinic service was possibly somewhat lower. She emphasized the difficulty of putting the costs on a comparable basis, but pointed out that the provision of contraception as an *additional* service in an established hospital or public health program would appear to be more economical than an independent program with relatively heavy expenses for house-to-house visits by a nurse.

Dr. Stix presented data indicating that the contraceptives prescribed for the Spartanburg patients were both more effective and more acceptable than was jelly for the Logan group. It was agreed, however, that more comparable data were needed before broad generalizations could be made.

Dr. Stix thought that with the limited funds available, subsidized contraception should perhaps be restricted to women for whom pregnancy would involve a risk to health, and should be established under direct hospital or public health supervision. She and Mr. Beebe also argued for greater attention to the needs of the individual patient and for more flexibility with respect to the types of contraception prescribed. They expressed the opinion that to terminate service with the rejection of a single prescription was to ignore the patient's continuing interest in and need for protection.

As to the more general question of the reduction of fertility in areas of population pressure, Mr. Beebe and Dr. Stix agreed with Dr. Vance that it was partly an educational problem. They suggested further that attempts be made to establish standards for commercial contraceptives and to obtain wider distribution of commercial methods at low cost in areas of high fertility.

In summary, the Round Table on Population this year did not have the general theme of a symposium. It was devoted instead to the consideration of a variety of research projects. These had in common the investigation of factors influencing human fertility. In character, they ranged from problems of trends and differences in birth rates, through studies of specific experiments in family limitation, to studies of the motivations underlying reproductive behavior; from problems of low fertility to those of regions of population pressure. I should like to emphasize that it is only through such careful and critical studies that it would be possible to formulate population policies which will be at once efficient and consonant with the fundamental values of our society.

REFERENCE

1. Stix, R. K. and Notestein, F. W.: *Controlled Fertility*. Baltimore: Williams & Wilkins, 1940, p. 152.

American Journal of Public Health
and THE NATION'S HEALTH
Official Monthly Publication of the American Public Health Association

Volume 31 September, 1941 Number 9

H. S. MUSTARD, M.D., *Editor*
MAZYCK P. RAVENEL, M.D., *Editor Emeritus*
LEONA BAUMGARTNER, M.D., *Associate Editor*
ARTHUR P. MILLER, C.E., *Associate Editor*
AUGUSTA JAY, *Editorial Associate*

Editorial Board
REGINALD M. ATWATER, M.D.
Chairman, and Managing Editor
IRA V. HISCOCK, Sc.D.
KENNETH F. MAXCY, M.D.
HENRY E. MELENEY, M.D.
ALTON S. POPE, M.D.

PUBLIC HEALTH BALLOONS

THIS is not an editorial on the late Wade Hampton Frost, but a discussion of one of his mental characteristics which, we believe, it is highly desirable to perpetuate in the search for and development of principles of public health administration. In a long personal and professional association with Dr. Frost we noted, time and again, a mental and even a physical restlessness in him whenever he confronted whatever presented the earmarks of an unattached fact. By "unattached" is meant some apparently sound observation without known relationships: an unmoored conclusion, floating in space; a sort of toy balloon bumping against the ceiling, with its string dangling just out of reach. Faced with such a situation, Dr. Frost would pace the floor. He would look out the window, return to his desk, take off or put on his glasses, gaze into space, light a cigarette. For the time being, all other things must wait, for they were relatively unimportant until proper disposition was made of this disturbing matter. For him the problem could be settled only in one of two ways: the balloon must either be punctured or moored. If it arose because of hot air, then heaven help its launcher. If it floated merely because present knowledge was not tall enough to grasp the dangling string and tie it into basic facts, Dr. Frost reached for and usually grasped that string.

It seems to us that this quality of Dr. Frost was as distinct as is genius in music or painting or mathematics. Because it was a natural gift, his analytic and synthetic approach to problems was as inevitable and effortless as cause and effect. He could no more have thought sloppily than can loose minds think straight. Now, though in public health the majority of minds are not the instruments of precision of a Frost, few of them are poor; and while only a small fraction of these minds will naturally click and mesh their observations as naturally as would a duck swim, most of them, with a little self discipline and practice, can make this search for principles and relationships nearly an automatic process. To a great extent it was the ability to inspire his students along these lines that made Dr. Frost such a good teacher. They sensed, from continuing association, that here was a master mind at work. They saw the beautiful and satisfying

results of testing and weighing observations, of detecting and discarding the false, of marshalling and synthesizing items found to be valid.

Today, more than ever, we need a renaissance of straight thinking in public health work. Wishes are becoming quite lustful about fathering thoughts, and opportunism is trying desperately to put an edge on a lot of very dull axes. As never before, the peoples of the world, particularly in the western hemisphere, are asking for that guidance which, in the face of surrounding threats, will preserve the public health. But, as always, there is a danger that enthusiasts, usually sincere but often fuzzy-minded, will gain the ear or interest of strongly placed political leaders, and put on a selling campaign for these loose toy balloons of public health. That lots of such unmoored activities are bobbing and bumping against the ceiling of public health practice is evidenced by the fact that not only have we gone beyond administrators and to liaison officers, but we are rapidly passing on to "coördinators."

ATTEND THE ATLANTIC CITY MEETING

READERS of the JOURNAL will have noted that increasingly in the past few months, more and more space has been devoted to the Seventieth Annual Meeting of the Association. Members have wanted details as to this or that, and good publicity practice has demanded an increased tempo as the time approaches for the meeting itself.

All of this is quite obvious, routine and proper. It makes things easier for the old members who, in October, will go to Atlantic City as a matter of course. Through such advance information they get a preview of what is to be offered and have the opportunity to re-savor, as it were, the benefits and pleasures of past meetings. But, actually, these old customers do not need much persuading about an Annual Meeting of the Association. They know they will get their money's worth, and about all that is necessary in their case is to tell them where and when. With the newer members, however, and even those who have been members for some time but have never been to a meeting, it is very necessary to make every effort to have them develop enthusiasm and reach a decision to go to meetings. Attendance by this group would, of course, tend indirectly to strengthen Association sinews. But more important from the standpoint of the individual are the direct benefits that would accrue to him or her personally and professionally. Giant problems, giant forces, giant minds are today stirring in public health. Rumblings of epidemics and deficiencies come from the war zones. Menaces, some actual others only potential as yet, shadow the health of people now living in a precarious peace. Controlled observation in the field, and the workbenches of science are making more precise the control of disease. As nowhere else in the world today, the Seventieth Annual Meeting will report and discuss these matters in their public health relationships.

One cannot question the value of this kind of information. It is of interest and importance to all engaged in this field; it is vitally necessary to those who have just embarked upon a public career, and it provides an opportunity for quick orientation of those who because of the specialized routinism of their work or remoteness of location, have not kept closely in touch with recent developments. And then there are additional reasons why the youngster in public health should go to Association meetings. These come under the generic heading of "broaden-

ing influences." He learns that there are perspectives, problems and practices other than his own, and she does the same. Boston discovers Los Angeles, and a southerner is amazed to learn that, without operating through county units, New England health departments do good work. The young nurse wonders where, and perhaps why, this nationally known nursing supervisor got that hat. One hears the lions of public health roar, and finds them better—or worse—than rumored. The young man and young woman make new friends in their own generation and in one way or another are brought to the attention of those whose interest might be helpful in future. We know of many a better job or increased opportunity precipitated by what at the time appeared to be casual Association contacts. We think particularly of one young chap who borrowed the money to attend a meeting and lived happily ever after.

Support your Government in this national emergency. Build a wall of defense by buying Defense Savings Bonds and Stamps.

—Buy Defense Bonds and Stamps—

Credit Lines

A Selective Digest of Diversified Health Interests

D. B. Armstrong, M.D., and John Lentz, M.S.

HEALTH EDUCATION IN ACTION

Political campaigners, ever alert to new ways of swaying the electorate, discovered some time ago that oratory plus hill-billy music was a winning combination at the ballot box. Health educators have likewise been quick to adopt fresh technics to make the public stop, look, and listen to health messages. It was our guess, however, that hill-billy music and health education would always remain poles apart despite the proven influence of such renditions as "Please Pass the Biscuits, Pappy" on the public of at least one great state.

Yet, it has happened. Hill-billy tunes have come into their own on health education programs! From the American Social Hygiene Association comes news of a series of meetings recently held in twelve villages located in the coal mining districts of West Virginia. These gatherings, organized to spread information about venereal disease, were arranged to fit as closely as possible into the accepted pattern of community life. The A.S.H.A. Field Representative knew that hill-billy music always lured local audiences when other attractions failed. So the programs designed to spread venereal disease information were opened with native tunes played by local boys. Following this "curtain raiser," A.S.H.A. films were shown, short talks were given by local health officials, and venereal disease literature was distributed.

These programs were most successful—churches, school houses, and village halls being filled to capacity. In one locality the entire congregation of a "revival meeting" asked to attend one of the meetings with the proviso, however, that the minister would be permitted to deliver his sermon at the close of the health program! We doubt if any other health program ever offered such an array of attractions: a hill-billy band, motion pictures, a lecture, free literature, and a sermon!

(The editors of "Credit Lines" regard this as an unusual and interesting project in health education. We would like to have news of similar undertakings for publication. Send us accounts of any programs you have sponsored in which unusual or novel methods were used to "get across" a health message.)

NOTES ON HEALTH PUBLICATIONS

"ABOUT TUBERCULOSIS," just offered to health and social agencies by the Life Conservation Service of the John Hancock Mutual Life Insurance Company, is an attractive and up-to-date publication which condenses essential lay information about the disease into 15 pages. That, in itself, is an achievement in view of the complexity of the subject. The publication presents in simple language and with appropriate emphasis, accurate and understandable

Please address samples of printed matter, comments, or other editorial contributions to the editors at One Madison Avenue, New York, N. Y.

statements with reference to diagnostic measures such as the tuberculin test and the use of the x-ray, and gives due stress to the dangers of contact infection, the importance of the sanatorium in treatment, and the part which all must play if tuberculosis is to be finally conquered. The publication was developed with the help of the National Tuberculosis Association and a committee of the American Trudeau Society.

The booklet is attractively illustrated and will be a timely contribution to lay education. Copies may be secured from the Life Conservation Service of the John Hancock Mutual Life Insurance Company, Boston, Massachusetts.

. . . . . .

There has come to our attention recently a descriptive brochure outlining a prepaid medical service plan approved by and affiliated with the Oregon State Medical Society. The fundamental purpose of the plan, according to the brochure, is to enable low-wage industrial and commercial groups whose annual incomes do not reach a recognized "comfort" level to obtain annual medical and hospital services by the payment of monthly fees through their employers. The services are on a group basis and are not available to individuals. The cost to the subscriber is approximately $2 a month. At the beginning of 1940, approximately 30,000 employees, representing hundreds of industries in Oregon, had been enrolled as subscribers. Copies of the brochure may be obtained through the Oregon State Medical Society, Portland, Ore. (For full details on a great variety of projects and activities in this field, the reader is reminded of the new and very excellent quarterly, *Medical Care*, with editorial offices at 1790 Broadway, New York, N. Y.)

. . . . . .

The Health Council of Cleveland, Ohio, has prepared for distribution to young men undergoing physical examinations for the armed forces, a "vest pocket" booklet covering subjects of especial concern to those rejected because of physical defects. Succinct information regarding proper food selection and good food habits, the necessity for dental care, facts about tuberculosis, venereal disease, and mental hygiene is set forth in a clear, matter-of-fact way that will help rejected young men to understand why they did not "pass" their physical examinations and what steps can be taken to insure a healthy, happy future. The section on mental hygiene is particularly well phrased. Young men will readily take "to heart" the advice that is given on this subject, which has seldom been expressed so adroitly.

Health departments, voluntary health and social agencies, and committees that are now endeavoring to meet the problem of the physically rejected draftee, in coöperation with federal agencies, and particularly with the Committee on Physical Rehabilitation, of which Dr. George Baehr is chairman, would find it advantageous to examine this publication from the Cleveland Health Council. Copies may be had by writing to the Council at 1001 Huron Road, Cleveland, Ohio.

. . . . . .

"Are You Fit for the Job?" is the title of a publication prepared by the National Federation of Business and Professional Women's Clubs, Inc. This booklet was designed to interpret the annual physical examination to members of this large organization and to encourage them to adopt habits and attitudes necessary to attain optimal health. A complete health appraisal form is included in the booklet which the individual may use as a guide in evaluating and raising personal health standards. A health examination record is also supplied with the booklet for the use of private physicians consulted by members of the clubs. This publication

should be quite effective in stimulating an interest in health conservation and physical examinations among the group of women to whom it is addressed. Copies, at a cost of *10 cents* each, may be secured by writing the National Federation of Business and Professional Women's Clubs, Inc., 1819 Broadway, New York, N. Y.

. . . . .

Annual reports for 1940–1941 continue to come from various agencies. Worthy of recognition here are those of the National Committee for Mental Hygiene, Inc., and the Cleveland Health Museum. The report of the former is aptly entitled "Finding a Way in Mental Hygiene." An imaginative and artistic cover designed to carry out the general theme of the report is one of the features gracing this publication. The text emphasizes current problems in the mental hygiene field including "the dismal failure of state authorities in many parts of the country to provide adequately for the mentally ill." Progress of psychiatric research is discussed with special reference to "the promising results of the newer forms of treatment for dementia praecox, such as insulin and metrazol shock therapy." The report adds, however, that researches in psychiatry are long-range problems and that early spectacular results are not anticipated though findings to date have been significant. Of especial interest to health workers is a section of the report dealing with mental health of teachers and the teaching of mental hygiene to school children. In sum, here is a stimulating summary of an organization's efforts "to find a way" in a field where progress is slow. We hope many contributors will see to it that funds "find a way" to this organization's treasury, for its work is worthy of widepsread financial support.

. . . . .

Dr. Bruno Gebhardt, director of the Cleveland Health Museum, can always be depended upon to present printed material in an unusual and arresting manner. The Museum's 1940–1941 report is of many colors—like Joseph's coat—and it catches the eye. A record of the Museum's history and activities to date is presented under the title "Laying the Foundation." Text, charts, and graphs are multigraphed on colored sheets of paper—blue, gray, yellow, red, and green—and the rainbow effect arrests ones attention more quickly than would a uniform presentation. The usefulness of the Cleveland Museum of Health and its acceptance by the public are convincingly set forth in the 1940–1941 report.

NEW FILMS

Health officials have long needed a motion picture for lay groups covering the clinical aspects of syphilis. The difficulties involved in preparing a film on this subject for mixed audiences are readily apparent. The American Social Hygiene Association has, however, bridged this gap successfully in the association's newest picture entitled "Plain Facts." The first half of the film describes syphilis. Actual cases are shown, the dangerous nature of the disease is stressed, and facts concerning diagnosis, treatment, and cure are explained. The second half of the film tells the story of gonorrhea by bringing out the same points of emphasis. The film is well coördinated and the narration, written and spoken by Dr. Walter Clarke, is excellently handled from the standpoint of content and delivery. This film should have a wide audience among industrial workers, school and college groups, and health assemblies. "Plain Facts" is one reel in length and is available in both 35 mm. and 16 mm. prints. Information concerning rental rates may be secured from the Association, 1790 Broadway, New York, N. Y.

. . . . .

"Another to Conquer" is the title of the National Tuberculosis Association's newest motion picture, scheduled for release in October. The film is designed primarily for Indian audiences, and tells the story of the new enemy which the American Indian faces—tuberculosis. The appeal of the film, however, will not be so limited. It will be prized by all people for its faithful portrayal of a cross-section of Indian life. Youngsters will like its western atmosphere with its dare-devil riding, alluring open spaces, sheep round-ups, and Indian dances. The facts about tuberculosis are necessary parts of the story—not merely morsels of cold information thrown into an otherwise romantic tale, according to the National Tuberculosis Association. The film was made on the Navajo Reservation in Arizona in coöperation with the U. S. Office of Indian Affairs and with the aid of the staff of the Navajo Service. The cast is made up of real Indians, with the exception of Dr. W. W. Peter, who gives a superb portrayal of the doctor. The photography is splendid.

"Another to Conquer" runs approximately 20 minutes and will be available in 16 mm. and 35 mm. prints after release in October.

A HELPING HAND

Among the front rank fighters in the venereal disease campaign sponsored by the U. S. Public Health Service and the American Social Hygiene Association are the pharmacists of the nation. According to officials directing the campaign, the great majority of pharmacists have readily coöperated and have made a very significant contribution to the general venereal disease education program. The men behind the prescription counters have demonstrated their sense of professional responsibility in this campaign. Window displays have been arranged, literature has been distributed, and pharmaceutical publications have carried articles urging druggists to lend full support to anti-venereal activities.

The attitude of the pharmaceutical profession toward the venereal disease control program is expressed in the May, 1941, issue of the *Journal of the American Pharmaceutical Association* as follows:

> Certainly the minimum degree of coöperation that any pharmacist can furnish is to give competent advice to those who come to him for information. Giving competent advice to the sufferer from syphilis or gonorrhea means (1) refusing to sell him any quack remedies for its "treatment," (2) discouraging him from going to see any quack doctor who advertises quick cures for venereal diseases, (3) impressing him with the seriousness of these diseases but pointing out that they *can* be cured through competent treatment, (4) urging him to consult a dependable physician for treatment.
>
> No pharmacist can do less, but many will wish to do more.
>
> We have to make good (in this undertaking). If you have not already done so, rid your pharmacy of venereal disease nostrums. Be proud of the fact that you stock no product for the self-medication of syphilis or gonorrhea. Obtain a supply of educational leaflets from your local or state board of health and give them a prominent spot on your counter.

The splendid support which pharmacists have given this public health activity has proved beyond doubt that the corner drug store can function as a vital coöperating unit in public health activities.

A PUBLICITY GUIDE

Advice on how to achieve publicity for health activities has been plentiful, but seldom has this advice come from expert sources. Now, however, an authority on all types of publicity has published a book which health educators should keep within easy reach whenever publicity campaigns are under way. The book is entitled "Profitable Publicity—How to Do It, How to Get It," and the author is Henry F. Woods, Jr.

Do you want to know how to write

news releases that appeal to the average man? Would you like "tips" on how to secure the coöperation of editors and reporters? Would you like to know the best way to arouse interest in health news? Mr. Woods answers these questions and many more in his volume. This book was designed to provide a thorough knowledge of the basic factors in effective and successful publicity work. It is very practical in its approach and clearly outlines the technic and methods by which desired results may be obtained through publicity.

Of especial interest to those charged with health publicity are the sections of the book pertaining to the use of statistics, the plan which publicity releases should follow to insure newspaper acceptance, the proper use of pictures, and the method of measuring publicity results.

This book might well be termed "a liberal education in the field of publicity." It covers essential phases of the subject fully and directly. You will not regret owning a copy of *Profitable Publicity*, published by Dorset House, Inc., New York, N. Y., at *$2.50 a copy*.

THE DOCTOR AND YOU

The Medical Book Department of Harper and Brothers has issued the first booklets in its "Help Your Doctor to Help You" series. While the subjects to date, such as Colitis, Gastric and Duodenal Ulcer, and Gallstones and Diseases of the Gallbladder, deal with various diseases outside the realm of public health as we ordinarily think of it, these booklets will be of interest to health educators as they are models of simplified scientific writing. Every practitioner has patients who seek answers to endless questions when told that they have this or that disease. Often the physician does not have time to answer these questions to the patient's satisfaction and sometimes he simply cannot answer questions in terms that the patient comprehends. The Harper booklets are planned to fill this need, and they are indeed a valuable addition to the growing library of books designed to give the layman an intelligent understanding of disease and health problems. The booklets are prepared under the editorship of a board of recognized medical authorities. Information concerning the series may be secured from Harper and Brothers, 49 East 33rd Street, New York, N. Y. The price of each volume is *95 cents*. The publishers emphasize that the booklets are *in no way* intended to take the place of the physician and his advice.

HOW TO MAKE MONEY

Voluntary health organizations are sometimes faced with finding ways and means of raising additional money when the annual appeal for contributions falls short of expectations. A novel way of procuring such financial support was recently devised by the Waltham, Mass., District Nursing Association. The scheme of the association is one that might be followed to advantage elsewhere.

Waltham is a historic community where many of the old original homes, schools, churches, and taverns still stand. The Nursing Association drew upon this historic background as a theme for a pictorial map of the community which shows structures that date as far back as 1733. Old Indian trails and the location where certain historic events took place are also designated. The association offered this map for sale at *10 cents a copy*. It is such an attractive item that it should have found many buyers.

Most people like pictorial maps, but it is infrequent that such maps of one's home community are available. We believe other voluntary health associations in need of funds might take a profitable cue from the Waltham Nursing Association.

WHAT'S A WORKSHOP?

From health educators pursuing graduate study during the summer come enthusiastic reports of a new plan of instruction designated by the term "Workshop." Under this modern system of learning, rigid adherence to fixed schedules of lectures, classes, assignments, etc., has been abandoned and students are left more or less "on their own" to delve into problems arising out of their experiences. Those who have witnessed workshops in progress and those who have attended them unanimously agree that this form of instruction is far more dynamic and practical than the accepted system of formal lectures, etc.

The philosophy and spirit of a typical workshop are well expressed in the following excerpt from a university bulletin:

> The Workshop differs from the conventional graduate course in a number of ways. There will be no lectures, no quiz sections, no examinations. The members of the staff have no syllabi to hand out. There is no set "ground to be covered." The "course of study" will develop out of problems which you—participants in the Workshop—have indicated as important for you. The purpose of the Workshop is to assist you to achieve progress in their solution and to see their relationships with larger problems. . . . To this end, the staff—a group of consultants with varied backgrounds and interests—will be available for conference individually and with groups of similar interest. In so far as resources permit, books and other published materials will be available in the building. The use of your time will be for you to determine. In order to conserve your time and that of the staff, a schedule of activities for the first few days is suggested. This is tentative and flexible. It may be changed if you desire.

A successful example of a workshop in the area of health education was held this summer under the direction of Miss Vivian Drenckhohn, Lecturer in Health Education, University of Michigan. The accomplishments of this workshop proved conclusively that the workshop system is a "natural" for graduate instruction in health education. Other universities and colleges—please copy!

MAGAZINE ARTICLES

"Life Begins with Vitamins." William L. Laurence. *Ladies' Home Journal.* July, 1941.

"Sunlight Cancer." James Ewing, M.D. *Ladies' Home Journal.* July, 1941.

"Diabetes in Your Family." Louise Fox Connell. *You Magazine.* July, 1941.

"In Case of Dogbite." Dorothea Dunlea. *Parents' Magazine.* August, 1941.

"What You Should Know About Children's Diseases." Morris Fishbein, M.D. *Parents' Magazine.* August, 1941.

"Let Them Eat Cream." J. D. Ratcliff. *Collier's Magazine.* August 2, 1941.

"Science Challenges the Master Killer." Paul de Kruif. *The Readers' Digest.* August, 1941.

"But Health Insurance Is Different." Nathan Sinai. *Harper's Magazine.* August, 1941.

"The Patient Comes First." Miles Atkinson. *Atlantic Monthly.* August, 1941.

SOME NOTES AND QUOTES

A new word has been added to the vocabulary of health education by Horace H. Hughes, Director of Public Information, Maternity Center Association, New York, N. Y. In a recent address, Mr. Hughes warned health workers to watch out for "snarks" when writing for or speaking to lay audiences. A "snark," Mr. Hughes explains, is a word or an idea which may be completely understandable to professional public health workers, but is not clear to those who have not been initiated into the mysteries of public health lingo. Watch out for "snarks," warns Mr.

Hughes, for they are the fifth columnists of health education! . . . Statistical note: Before the Social Security Act became a law in 1935, we had 762 counties with full-time health departments. We now have 1,577 . . . Have you heard the stirring medical and health dramatizations on the weekly radio program "Cavalcade of America"? A recent script dealt with spotted fever and the heroic efforts of representatives of the U. S. Public Health Service to control this disease. Another recent dramatization was entitled "The Story of Dr. S. Josephine Baker." This program told of Dr. Baker's early experiences as a health inspector in New York's tenement districts, her efforts to establish the first Bureau of Child Hygiene, and her contact with Mary Mallon, the famed "Typhoid Mary." Here's a line from the script worth quoting: "I have continued the fight for better health conditions for mothers and babies because I believe children are the most important people in the world!" The "Cavalcade of America" program is presented by NBC every Monday evening. . . . A Chicago movie theater proudly proclaims in its advertising copy that all patrons who attend its performances will be given a supply of the theater's newly discovered "Vitamin R." The ingredients of "Vitamin R": relaxation, refreshment, revitalization! . . . We always get a "lift" out of the *Health Officer's News Digest*, a monthly publication of the Public Health Committee of the Cup and Container Institute, 1790 Broadway, New York, N. Y. It is offered free to health workers. Don't miss this snappy little journal. . . . New York's Museum of Modern Art offers the following pointers to distinguish a good poster from a poor one: (1) Ingenious and imaginative use of material as opposed to banal realism, (2) Clarity and simplicity of arrangement as opposed to cluttered designs, (3) Quality of craftsmanship in design as opposed to dependence on copy and slogans, (4) Appropriate and appealing use of color. . . . A quote from Dr. Paul F. Lazarsfeld's book, ***Radio and the Printed Page:***

> The United States points with pride to its small and declining illiteracy rate. But at the same time science makes such rapid progress that the proportion of what a person does not know to what he knows is probably much greater nowadays than it was when very few knew how to write or to read. In fact, if literacy is defined as competence to understand the problems confronting us, there is ground for suggesting that we are becoming progressively illiterate today in handling life's options.

A quote from the Honorable Winston Churchill: "There is no more far-reaching investment for a nation than to put milk, food, and education into young children."

BOOKS AND REPORTS

Approved Laboratory Technic, Clinical, Pathological, Bacteriological, Mycological, Parasitological, Serological, Biochemical and Histological—*By John A. Kolmer and Fred Boerner. (3rd ed.) New York: Appleton-Century,* 1941. 921 pp. Price, $8.00.

The title of this book has the word "Approved" to indicate that the descriptions of methods are approved by five persons who are members of the Society of Clinical Pathologists. The book was prepared with the aid of 28 collaborators, most of them well known in their respective fields. The Approved Laboratory Technic has been very widely used since its first edition in 1931 as a very comprehensive manual of laboratory methods. The third edition has five sections and an appendix.

It contains a section of general laboratory methods dealing with the microscope, housing, feeding, inoculating, bleeding and autopsying animals, and diagnosis of animal diseases.

The second section describes clinical pathological methods, devoting 262 pages to this subject. Bacteriological methods are given in the third section which also includes diagnostic mycological methods and procedures to examine the skin and mucocutaneous membranes for animal parasites.

In this section we find three chapters of particular interest to the public health laboratory worker, namely chapters on the bacteriological examination of milk, water, and the testing of disinfectants.

The fourth section, entitled serological methods deals with the technic of agglutination, precipitation, serological tests for syphilis, blood grouping, complement-fixation test with various antigens; it includes the description of the lyophile process and also methods for conducting tests for allergy.

The fifth section is chemical and describes methods for the chemical analysis of blood, determination of basal metabolic rate, toxicological methods, histological technic, and includes a chapter on the chemical analysis of milk and other foods.

The Appendix, 26 pages, deals with a variety of subjects: paroxysmal hemoglobinuria, prothrombin determination, examination of semen, liver function tests, determination of serum lipase, the simplified Kolmer complement-fixation test, the Eagle modification of the Wassermann test, determination of vitamin C, methods for the determination of various sulfonamide drugs in the blood and urine, and a method for the determination of thiocyanates in the blood.

The methods, on the whole, are well selected; their description is clear and easy to follow. The book is profusely and well illustrated but some of the pictures are too elementary or trivial, recalling supply catalogues. Colored plates of blood cells and pictures of crystals of sulfonamide drugs in the urine are lacking. References are very scant. The interpretation of findings would have made the book more interesting and useful.

The third edition (1941) differs from the second one (1938) only by the addition of 26 pages in the form of an appendix. Thus, due to the rapid progress in the field of laboratory

methods, many parts of the book are out of date in 1941. The public health worker will find the part dealing with the typing of pneumococci slightly obsolete and will find no phosphatase test in the section for examination of milk. Nevertheless the book will remain, what it was, a very useful and comprehensive manual of laboratory methods. A reprint of the Appendix would be sufficient for those who have the second edition. JULES FREUND

When Children Ask—*By Margueritte Harmon Bro. Chicago: Willett, Clark, & Co.*, 1940. 267 pp. Price, $2.00.

Probably one of the most vexing problems which confront parents in bringing up their children is that of answering their many questions. "What happens when people die?" "Where do babies come from?" "Do you believe in the Bible?" These and many other questions which children ask are treated in this book in a sane, understanding manner by Margueritte Bro, herself the mother of four children who have confronted her with many bewildering queries.

Mrs. Bro feels that "questions are the child's growing edge," that they are a gateway to his knowledge about life, and that much hinges upon whether adults answer them wisely and well. Besides having four of her own children, she has taught school and has wide experience as a consultant and lecturer to boys and girls in high school and college.

The book should be enlightening and helpful to parents. ETHEL GORDON

British Cities at War—*A report by James L. Sundquist for the American Municipal Association. Publication No. 76, 1941. Chicago: Public Administration Service.* 110 pp. Price, $1.00.

That public health administrators are hungry for reliable information about their responsibility in a military emergency is apparent. The report of the National Technological Committee (*A.J.P.H.*, June, page 663) has been available now for two months and has been widely read. This present report is more extensive and is up to the minute, including some reports dated less than a month before its publication.

Although the section on public health is not a conspicuous part of this volume, a reader will readily appreciate the fact that in Great Britain an enormous responsibility has been heaped upon the health authorities during the emergency and that their new responsibility has included tasks unfamiliar to their American colleagues.

This report is believed to be the most comprehensive of its kind now available. It is an absorbing account of the effects of active warfare on British cities and shows how their local defense arrangement and their ordinary services have worked in a great crisis.

R. M. ATWATER

Health Education. *(2nd revision.) Report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association with the coöperation of Advisory Committee. Washington, D. C.: National Education Association,* 1941. 368 pp. Price, $1.50.

Prepared primarily as a guide for teachers in elementary and secondary schools and institutions for teacher education, this volume supplies from numerous sources an authoritative compilation of technical statements and a consensus of professional opinions relative to health education.

Following a foreword, an impressive list of committee members, and statements of aims and definitions of health education, are twelve chapters packed with information clearly presented.

Subjects include: child growth and development, health protection, health guidance, plans and policies of school administration, learning situations—processes of meeting them, activities and materials, and teacher preparation. Valuable features are illustrative units of work contributed by teachers and supervisors representing a wide geographical range, and 50 pages of bibliography, including references to source material.

The Joint Committee has rendered another significant service in the preparation of this up-to-date handbook which should be of assistance to many professional and lay groups, especially to those interested in education and in public health. Anyone engaged in health education should have a copy near at hand. IRA V. HISCOCK

Fundamentals of Administration for Schools of Nursing—*Report of Committee to Study Administration in Schools of Nursing. New York: National League of Nursing Education,* 1940. 270 pp. Price, $2.50.

The increasing necessity for coming to grips with the longstanding complex financial problems of hospitals and schools of nursing as well as those related to other types of educational institutions and projects has been developing a demand for clarification of the principles of organization and administration and their application to schools of nursing. Therefore, the publication of this book is timely.

In the foreword we are told this report is not a manual or textbook on administration but rather that it is expected to aid in developing a philosophy of administration which will stand in good stead when coping with the administrative problems inherent within the school of nursing itself. The committee which prepared the report states that it wishes to emphasize the need for understanding the nature of healthy administration and its application to the individual school before attempting diagnosis and treatment of ailments.

The Summary (Part III), both lucid and well organized, contributes quite a deal to this needed understanding. Part I, containing a discussion of the purpose and functions of schools in general and also in relation to the school of nursing, as well as Part II dealing with an analysis of administrative functions in schools of nursing, touch upon many matters which those responsible for these schools and their administration need to understand thoroughly. Chapters X, XI, and XII on business administration and principles of organization will be found particularly helpful. Administration in relation to curriculum planning, teaching, selection and welfare of personnel and students are also covered.

Unfortunately throughout Parts I and II there is a handicapping lack of directness and simplicity in the arrangement of subject matter. Involved phraseology and verbosity make it difficult for the reader to grasp concepts with ease and clarity. It is hoped these factors will not deter those concerned with administration of our schools of nursing from making a careful study of the report. Because of its very nature this work merits close attention. Not infrequently, embarking upon the study of a subject which needs thought and clarification, results in the production of further literature dealing with its various aspects. We trust this report will have such an effect. A good bibliography provides suggestions for further reading and study.

We cannot close our comments without complimenting the publishers. It is seldom one comes across a book of this size which can be handled with such ease. The choice of paper, the type, size of page, and other details are admirable.

KATHARINE G. AMBERSON

Help **Your Doctor to Help You** Series:

Gastric or Duodenal Ulcer. 53 pp.
Colitis. 30 pp.
Gallstones and Diseases of the Gallbladder. 41 pp.
Migraine. 37 pp.
Food **Allergy.** 50 pp.

New York: Harper, 1941. Price, $.95 each.

These are five of a longer series of booklets prepared under the auspices of an editorial board of distinguished physicians "with the idea of supplying answers to those questions that come crowding into the mind of a man or woman who has just been told by a physician that he or she has a certain disease." How much *ought* a patient to know about the methods of diagnosing food allergy or gallstones, about the meaning of various symptoms, and about alternative methods of treatment? And suppose he buys the book on colitis or the one on ulcers because he suspects that this is his diagnosis, without having been to a physician?

Such booklets can, at most, give some detailed pathological information. They cannot supply the background of general physiological knowledge without which the reader, especially when stimulated by anxiety about his own aches and pains, may draw surprisingly incorrect inferences. The stated purpose to "help your doctor to help you" assumes that the patient *has* a doctor. If he has, and if the doctor receives kindly the sort of questioning which these books are likely to stimulate, both halves of the medical pair will probably be benefited. But if the patient who suffers from headaches, or who has pains which seem like those of a friend who had a gallbladder operation, buys the appropriate book as a substitute for the presumably more expensive course of treatment with a doctor—what then?

Recognizing their disadvantages, these authoritatively prepared booklets will have some usefulness. Whether, as the preface hopes, they will be substitutes for the big old-fashioned "Home Doctor Book" is doubtful. They tell much more than such compendia generally do and are written for better informed and sophisticated persons. A strictly logical mind would urge that they be sold only on a doctor's prescription. But who, in an arsenal of democracy, would propose thus to limit the freedom of the printing press? MICHAEL M. DAVIS

Public Health and Hygiene—*By Charles F. Bolduan, M.D., and Nils W. Bolduan, M.D. (3rd ed.) Philadelphia: Saunders,* 1941. 497 pp. Price, $3.00.

This is a well printed, compact text which covers a surprising range in the 357 pages devoted to discussion. The material is presented clearly, concisely, and with scientific accuracy.

In certain instances, however, the presentation is too much abbreviated for adequate handling of the subject. For example, on page 57 more definite warning should be given against the hazards involved in the use of hydrogen cyanide and carbon bisulfide as fumigants for the destruction of insects and vermin. Furthermore, it is not clear why the reader should be told how to remove fleas from animals dead of suspected plague. If discussed at all, it would seem more appropriate to give instructions as to the method of disposing of such animals and their fleas with safety.

On page 81 occurs the statement, "careful autopsy examinations have shown that there is hardly a person over thirty years of age who does not show signs of once having harbored tubercle bacilli in his body." The results of tens of thousands of Mantoux tests in young adults should outweigh the rela-

tively meager evidence on this point afforded by autopsies made many years ago. If negative Mantoux tests have the significance ascribed to them on page 84, it must be concluded that in many parts of this country the majority of individuals have not been in effective contact with tubercle bacilli prior to attaining the age of 30 years.

On page 89 we are told that "it is important to bear in mind that the ordinary milk supply is frequently contaminated with tubercle bacilli derived from tuberculous cows." The text being intended for use primarily in the United States, the term "frequently" needs some clarification, reflecting the fact that less than 0.5 per cent of all cattle tested in the United States react positively to tuberculin. This important point is not mentioned, the sole preventive measure discussed being pasteurization. Valuable as pasteurization is, it is too much to hope for its perfect operation at all times so that the elimination of reactors from dairy herds is a definite, logical, and important accessory factor of safety.

On page 340 the calculations used to illustrate the arithmetic method of estimating populations in the intercensal years are based upon the assumption that exactly ten years intervenes between federal censuses. In the years selected, however, this was not the case, the federal census being referred to the dates April 15, 1910, and January 1, 1920. The intervening period was sufficiently less than ten years to invalidate the estimated annual increase in population used in compiling the table on that page. Although these particular census dates are not so absolute and sacred as they appear, it is advisable to consider them so and to make the necessary corrections if for no other reason than to prevent apoplexy among the vital statisticians, should they happen to read the book.

Criticism of details, such as these, is not intended to apply to the book as a whole. The authors are to be commended for producing a text filled from cover to cover with useful information, condensed in form, free from padding, and appropriate for its intended field. M. E. BARNES

Proceedings of the First American Congress on Obstetrics and Gynecology, Cleveland, Ohio, September 11–15, 1939. *Fred L. Adair, Editor. Evanston, Ill.: The Mumm Print Shop, Inc.*, 1941. 907 pp. Price, $5.00.

This is a rather unusual volume in that it portrays the many sides of an important clinical and public health problem. Maternity care has been undergoing many changes in the last 25 years, and some of these changes will, no doubt, remain as permanent improvements. It is timely that a Congress should be held and its proceedings appear during this period of change.

The book is nicely divided into the four sections of Medical, Nursing, Public Health, and Hospital Administrators and Educators. Each of these sections is well covered in the program of the Congress, and the Nursing and Public Health Sections should prove particularly valuable to workers in those fields.

The principal value of the book, no doubt, lies in its exhibition of the "present status" of maternity and infancy problems.

L. A. CALKINS

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Superman, *et al.*—Have you been inclined to be a bit vehement in your opinion of the "funny" books that are spued out, literally by the millions, each month for the edification of the children and infantile-minded adults? Before you go off the deep end it would be well for you to read this discussion of some possible virtues of the current model, stream-lined fairy story.

BENDER, L., and LOURIE, R. S. The Effect of Comic Books on the Ideology of Children. Am. J. Orthopsychiatry. 11, 3:540 (July), 1941.

***Diphyllobothrium latum* and Friends**—If you like to eat fresh water fish, perhaps you will be happier if you pass by this discussion of some of the hundred varieties of flukes, tapeworms, and round worms that make life hideous for the finny tribes of the several Great Lakes. As the author says, the well cooked worm is harmless but still the idea is far from appetizing.

DETWILER, J. D. Parasitic Infestations of Fish. Canad. Pub. Health J. 32, 6:293 (June), 1941.

Keeping the Tuberculous Out of the Army—Before the service was taken over by the army, the New York City Health Department x-rayed 16,000 odd selectees and guardsmen, at a cost of $1.47 each. Although the total cost was high it is estimated that this service saved the United States more than 5 millions, for the United States Government eventually pays out $10,000 for each soldier accepted with tuberculosis. For the statistical findings, see this useful paper.

EDWARDS, H. R., and EHRLICH, D. Examinations for Tuberculosis. J.A.M.A. 117, 1:40 (July 5), 1941.

For the Cure of Gonorrhea—Sulfathiazole is best. Other supportive treatments and tests of cure are described.

ELLIOT, H. M., *et al.* Treatment of Gonorrhea in the Male with the Sulfonamides. Ven. Dis. Inform. 22, 6:197 (June), 1941 (also)

UHLE, C. A. W., *et al.* Gonorrheal Urethritis in the Male. J.A.M.A. 117, 4:247 (July 26), 1941.

Encephalitis Rears Its Ugly Head—St. Louis and western type equine encephalitis combined to make human life miserable in Yakima, Wash. Some patients had one, some the other, and some mixed infections. The sulfonamide drugs didn't help, neither did immune serum in the equine encephalitis cases.

HAMMON, W. McD. Encephalitis in Yakima Valley. J.A.M.A. 117, 3:161 (July 19), 1941.

Vitamin C Content of Fruit Juices—What is your vitamin C costing you? At the prevailing market prices at the time of this study the needed 50 ml. of ascorbic acid cost 2.7 cents in the form of canned orange juice, 3.1 cents as canned grape fruit juice, 3.7 cents as fresh orange juice, 4.6 cents as fresh grape fruit juice, 6.3 cents as canned tomato juice, and 13 cents as canned pineapple juice.

HOLMES, A. D., *et al.* Comparative Costs of Vitamin C in Fresh and Commercially Canned Fruit and Vegetable Juices. New Eng. J. Med. 225, 2:68 (June 10), 1941.

Tuberculosis Is Not an Industrial Disease, *per se*—Socio-economic conditions are factors as great as, if not greater than, the widely recognized, occupational hazards in producing tuberculosis morbidity and mortality,

but industry still has a responsibility in eliminating the hazards, and in the rehabilitation of the cured employee.

JACOBS, M. S. Tuberculosis in Industry. Pub. Health Nurs. 33, 7:414 (July), 1941.

Who Gets Hurt and How—Public accidents cause a third more deaths than all the infections and parasitic diseases combined. Motor vehicle accidents are by far the most important cause. Disability rates from other accidental causes are high too. Men are hurt much more frequently than women, older people more than youngsters, reliefers more often than those higher up on the income scale (except in automobiles). Health officials will find a wealth of statistical detail in this analysis.

KLEBBA, J., and BRITTEN, R. H. Public Accidents among the Urban Population as Recorded in the National Health Survey. Pub. Health Rep. 56, 28:1419 (July 11), 1941.

Ocular Manifestations of Avitaminosis—In the summary of this excellent but highly technical paper, it states that the biomicroscopic examination is a satisfactory method of detecting early vitamin A deficiencies. Ocular conditions which the examination reveals improve after months of treatment with vitamin A of high potency. [P. S. The summary and discussion were about all I succeeded in mastering.]

KRUSE, H. D. Medical Evaluation of Nutritional Status. Pub. Health Rep. 56, 26:1301 (June 27), 1941.

More Trichinosis Findings—Ten per cent of the examinations of the diaphragms from persons dying in Nashville revealed larvae of *Trichinella spiralis*. None were in persons under 20, most were in persons in the fifth decade of life.

MELENEY, H. E. Trichinosis in Human Diaphragms in Nashville, Tennessee. Am. J. Hyg. 24, 1:18 (July), 1941.

Hero—Any researcher who infects himself with hookworm in order to count the egg output for a hundred days deserves some kind of a medal. Altogether, approximately seven million appeared. The biggest day's output was 233,000.

PALMER, E. D. The Course of the Daily Egg Output During an Early Infection with the Hookworm *Necator americanus*. Am. J. Hyg., 34, 1:1 (July), 1941.

Fifty Times More Costly than **Strikes**—Fifty million man-days were lost because of illness and accidents among industrial workers last year. Suppose we could prevent 10 per cent! It would be enough to build five battleships. Some of the public health implications are strikingly presented. This is the fourth of a series of papers on preparedness, all of which are "musts."

PARRAN, T. The Function of Public Health in Defense (Symposium on Medical Preparedness). J.A.M.A. 117, 3:186 (July 19), 1941.

Pertussis Vaccination—More evidence of the value of whooping cough prophylaxis. It is suggested that revaccination 2 years after the original immunization is a desirable procedure. The opsonocytophagic test proves a reliable index of immunity.

RAMBAR, A. C., *et al.* Studies in Immunity to Pertussis. J.A.M.A. 117, 2:79 (July 12), 1941.

For Mask Wearers—Laundering gauze masks enormously increases the bacterial filtering efficiency. Maximum efficiency is reached after twenty launderings. Materials vary widely in filtering efficiency and air resistance, so you had better read the whole article.

ROOKS, R., *et al.* Hospital Masks: Their Bacterial Filtering Efficiency and Resistance to Air Flow. Pub. Health Rep. 56, 28:1411 (July 11), 1941.

Symposium on Polio—Last words on the etiology diagnosis, pathology,

prevention, and care of poliomyelitis by a collection of top-notchers.

SABIN, A. B., *et al.* Etiology of Poliomyelitis (and five related papers). J.A.M.A. 117, 4:267 (July 26), 1941.

Antidote for those Sanitary Blues—Are you a bit down in the mouth about your job and its real value to this distraught country of ours? Then read this presidential address to the Western Branch A.P.H.A. There's much to be done that's worth while.

SHEPARD, W. P. A National Emergency Exists. Pub. Health Rep. 56, 27:1351 (July 4), 1941.

Suggested by Our British Brethren—Streptococci accumulate in the dust on bedclothes. When the bed is made the dust is spread about in the air. Treating blankets with a spirit solution of liquid paraffin prevents most of this dust, and is recommended as a routine, just as floors are oiled for the same purpose.

THOMAS, J. C., and VANDEN ENDE, M. The Reduction of Dust-borne Bacteria in the Air of Hospital Wards by Liquid Paraffin Treatment of Bed Clothes. Brit. M. J. 4199:953 (June 28), 1941.

Lead, Arsenic, and Apples—Nine healthy orchardists ate, on the average, three recently sprayed apples a day for a 10 day period. They ingested from 1 to 26 mg. of lead and 0.3 to 6.8 mg. of arsenic per day. Most of it could be accounted for in the excretions but not all. However, no ill effects could be discovered.

WEBSTER, S. H. Lead and Arsenic Ingestion and Excretion in Man. Pub. Health Rep. 56, 27:1359 (July 4), 1941.

BOOKS RECEIVED

SCHOOL HEALTH SERVICES. By W. Frank Walker and Carolina R. Randolph: New York: Commonwealth Fund, 1941. 172 pp. Plus Tables 25 pp. Price, $1.50.

BRITISH CITIES AT WAR. A Report of the American Municipal Association. By James L. Sundquist. Chicago: Public Administration Service, 1941. 110 pp. Price, $1.00.

AN IMPROVED AIR SAMPLING DEVICE FOR FIELD WORK. By F. A. Van Atta and Clyde H. McClure. Chicago: Illinois State Department of Labor, 1941. 9 pp.

UNIVERSITY OF PENNSYLVANIA BICENTENNIAL CONFERENCE.

DEVELOPMENT OF OCCLUSION. By William K. Gregory, B. Holly Broadbent and Milo Hellman. Price, $1.50.

THE STUDY OF MAN. By Lawrence J. Henderson. Price, $.25.

Philadelphia: University of Pennsylvania Press, 1941.

INFANTILE PARALYSIS. A Symposium Delivered at Vanderbilt University April, 1941. New York: National Foundation for Infantile Paralysis, 1941. 239 pp. Price, $1.25.

DOCTORS DON'T BELIEVE IT. WHY SHOULD YOU? By August A. Thomen. New York: Simon & Schuster, 1941. 384 pp. Price, $2.50.

PAPERS OF WADE HAMPTON FROST. A Contribution to Epidemiological Methods. Edited by Kenneth F. Maxcy. New York: Commonwealth Fund, 1941. 628 pp. Price, $5.00.

ANALYTICAL CHEMISTRY OF INDUSTRIAL POISONS, HAZARDS AND SOLVENTS. By M. B. Jacobs. New York: Interscience Publishers, 1941. 661 pp. Price, $7.00.

THE WONDER OF LIFE. How We Are Born and How We Grow Up. Milton I. Levine and Jean H. Seligmann. New York: Simon & Schuster, 1940. 114 pp. Price, $1.75.

EFFECTIVE LIVING. By C. E. Turner and Elizabeth McHose. St. Louis: Mosby, 1941. 432 pp. Price, $1.90.

THE CHILD AND YOU. By F. J. Kieffer. Milwaukee: Bruce, 1941. 150 pp. Price, $2.00.

AMERICANS, LIVE LONGER! By W. W. Bauer. Indianapolis: Bobbs-Merrill, 1940. 219 pp. Price, $2.00.

GERMS AND THE MAN. By Justina Hill. New York: Putnam, 1940. 461 pp. Price, $3.75.

FORWARD TO HEALTH. The Story of Ten Years in Westchester's Program for a Healthier Community. White Plains: Health Department, 1941. 71 pp. Free.

THE COMPLETE WEIGHT REDUCER. By C. J. Gerling. New York: Harvest House, 1941. 246 pp. Price, $3.00.

The 70th Annual Meeting

L. Van D. Chandler, Chairman, Publicity Committee

THE Chairman of the Publicity Committee is plagued by the last sentence in the editorial entitled "Attend the Atlantic City Annual Meeting" in this issue. He looks at his friends, all veteran annual meeting attenders, and wonders if one of them is the lucky fellow. He wonders about himself, but knows he does not qualify, because he never borrowed the money to go anywhere, nor could he if he wanted to, and even if he did, how would the editor know? Altogether it is a wholly unsatisfactory last sentence. Where did he borrow the money? Did he learn at the annual meeting how to pay it back? Did he ever pay it back? Which meeting was it, in what city? Was there a race track nearby?

With visions of sugar plums dancing in his head, the Publicity Chairman cautiously approaches his task of telling what will be going on during the 70th Annual Meeting in Atlantic City, the week of October 12. He has many promises and pledges to report, but no member of the New Jersey Committee, including the Executive Secretary, Dr. Salasin, has mentioned living happily ever after. That's something even the Chamber of Commerce and the Convention Bureau have overlooked. No one has said anything, either, about lending money to anybody to finance the trip. If that last point is perfectly clear, he can relax and talk about things that really will happen.

There will be an Annual Meeting, advanced far beyond any former meeting from the point of view of attendance, and extensiveness and quality of the scientific program. No one who saw the preliminary program in the August JOURNAL can doubt the latter statement, and proof of a record attendance lies in the reservation books of Atlantic City's hotels. There are so many hotels, excellent accommodations at moderate prices are still to be had, but it would be unwise to postpone reserving rooms longer, if convenience to the Convention Hall is desired. The scientific sessions, with very few exceptions, will be held in Convention Hall. Here, too, we register, seek our information, inspect scientific and commercial exhibits, and from here we leave for our tours of inspection and entertainment functions.

Several important program additions have been made since the August JOURNAL went to press. Dr. Huntington Williams, now in England, will contribute his up-to-the-minute observations to the session in which Dr. Parran and Dr. Eliot are already scheduled. Dr. George Baehr, Medical Director of the Office of Civilian Defense, has agreed to speak on the work of the Medical Division.

The National Organization for Public Health Nursing announces the subject of its luncheon session on Friday as "How the Citizen Can Help to Further Public Health Programs." Miss Grace Ross will preside, and the speakers are Dr. Carl Buck, the Association's Field Director, and Dean Walter J. Matherly, President of the Florida State-Wide Public Health Committee.

The International Society of Medical Health Officers has changed the time of its sessions from Monday morning, afternoon, and dinner, to Sunday

afternoon, dinner on Sunday, and Monday morning.

New names representing new fields of interest have been entered on the Health Education Institute teaching roster.

A Health Education Center, conducted for the Health Education Section by the Social Work Publicity Council and the Department of Social Work Interpretation of the Russell Sage Foundation, is a development not previously announced. It is under the supervision of Mrs. Mary Swain Routzahn and Mrs. Sallie Fraysur. Designed originally as an adjunct to the Health Education Institute, its usefulness to all delegates interested in health education was at once obvious, and it was decided to maintain it during the entire convention. All types of health education materials will be assembled here for examination. Consultations will be arranged for the discussion of special problems. The objective is to make the Health Education Center of the utmost practical value.

And there are big things in the wind, not yet ready to be remarked on in detail, but to be mentioned as " in preparation." Invitations have been dispatched in an effort to bring to Atlantic City British public health workers whose experiences in emergency situations will answer questions American health workers are asking now. There is likelihood that the Program Committee's requests will be granted. Further, the Atlantic City Annual Meeting may well turn into a Pan-American Health Congress in a very real sense if the officers of the federal health departments in the twenty Central and South American republics respond to the call sent out to them with the approval of the State Department. If they come, there is opportunity here for an exchange of information beneficial to public health workers in the United States, to our Latin American colleagues, and to public health in the western hemisphere.

The New Jersey Committee is winding up affairs incident to the reception and entertainment of 4,000 delegates. Tentatively they announce inspection trips to the county institutions, including the new Atlantic County Hospital for Tuberculous Diseases, to the water shed, sewage department and filtration plant, and to the Betty Bacharach Home for Afflicted Children. There are rumors of sail boat rides, bingo parties, golf tournaments, sight-seeing trips, visits to wineries for everybody; and of fashion shows, rolling chair rides, bridge-luncheons, and musical teas for the ladies. They have been planned to fill idle moments before, between, and after the scientific sessions.

The spaciousness of the convention facilities in Atlantic City make it possible to present a scientific exhibit this year of impressive proportions. Federal, state, and local official and voluntary agencies have responded generously to the call, and many of them are creating new exhibits which will be shown here for the first time.

The motion picture program lists a number of films either specially prepared for the 70th Annual Meeting or held so that public health workers might have the privilege of viewing them before they are generally released.

All the machinery of the 70th Annual Meeting moves into operation on Sunday morning, October 12. Registration headquarters will be opened, the Health Education Institute and meetings of related organizations get under way. From that time until Friday afternoon, October 17, the Program Committee, the New Jersey Committee, the managements of hotels and Convention Hall, and the natural beauties of Atlantic City unite to fill every hour satisfyingly.

APPLICATION FOR HOTEL ACCOMMODATIONS

American Public Health Association

Boardwalk Hotels

Key No.	*Single Rooms with Bath*	*Double Rooms with Bath*
32 Ambassador ..	$3-$4-$5-$6	$6-$7-$8-$10
22 Brighton	$3-$4-$5	$5-$6-$7-$8
6-7 Chalfonte-Haddon Hall	$3-$4-$5-$6-$8	$6-$8-$10-$12
33 Chelsea	$3-$4-$5	$5-$6-$7-$8
28 Dennis	$3.50-$4-$5-$6	$6-$7-$8-$9-$10
14 Knickerbocker	$3-$3.50-$4	$5-$6-$7
11 New Belmont	$2.50-$3	$4-$5-$6-$7
34 President ...	$3	$5.50-$7-$8
31 Ritz - Carlton	$3-$3.50-$4-$5	$5-$6-$7-$8-$10
4 Seaside	$3-$3.50-$4	$5-$6-$7
29 Shelburne ...	$4-$5-$6-$8-$10	$6-$7-$8-$10-$12
21 Traymore ...		$8-$10-$12

Avenue Hotels

Key No.	*Single Rooms with Bath*	*Double Rooms with Bath*
30 Arlington ...	$3.50-$4	$5-$6
19 Byron		$4.50-$5-$5.50-$6
8 Colton Manor	$3-$3.50-$4-$5	$5-$6-$7-$8-$9
25 Crillon*		$5-$6
26 Eastbourne ..		$4.50-$5-$6
15 Flanders	$3-$4	$5
24 Glaslyn-Chatham		$5
17 Jefferson	$3-$3.50	$5-$6
18 Kentucky ...	$2.50	$4
9 Lafayette ...	$3-$3.50-$4	$5-$6-$7
20 Madison	$3-$3.50-$4	$5-$6-$7
16 Monticello ..		$5
3 Morton	$2.50-$3-$3.50-$4	$5-$6-$7
10 Penn-Atlantic	$3	$5
13 Princess	$2.50	$4
Runnymede..	$2.50-$3-$3.50-$4	$4-$5-$6-$7
12 Senator	$3-$3.50-$4	$5-$6-$7

All hotels offer Suites and DeLuxe Rooms. Rates can be ascertained by direct correspondence with the individual hotels.

* Breakfast Included

Whenever possible, arrangements should be made for double occupancy of rooms; only a limited number of single rooms are available.

A. J. MORGAN, Chairman
HOTEL COMMITTEE
16 Central Pier,
Atlantic City, N. J.

..... 19.....

Dear Sir:—Please make hotel reservations noted below:

Hotel ..... First Choice

Hotel ..... Second Choice

Hotel ..... Third Choice

.... Double Rooms with bath for .... persons. .....Rate desired $.... to $.... per day

.... Single Rooms with bath. .....Rate desired $.... to $.... per day

.... Suites—Parlor, ... Bedroom(s) with bath for .... persons. ....Rate desired $.... to $.... per day

Arriving October ....., hour ..... A.M. ..... P.M. Leaving .....

If the hotel of first choice is unable to accept the reservation, the HOTEL COMMITTEE will endeavor to comply with your second or third choice in the order named. You will receive direct confirmation from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	*Street Address*	*City*	*State*

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Alfred L. Adam, M.D., Municipal Bldg., Natchez, Miss., Director, Adams County Health Dept.

Oswald N. Andersen, M.D., School of Health, Stanford University, Calif., Director

N. Paul E. Anderson, M.D., Lane County Court House, Eugene, Ore., Acting Director, Lane County Health Dept.

Elizabeth E. Bishop, M.D., M.P.H., Court House, Baker, Ore., Baker County Health Officer

Alpheus W. Blizzard, Ph.D., South Carolina Public Service Authority, Moncks Corner, S. C., Acting Director, Health and Sanitation Div.

Leroy E. Burney, M.D., M.P.H., 539 Post Office Bldg., Kansas City, Mo., Sub-regional Consultant, U. S. Public Health Service

Charles C. Crosby, M.D., Jefferson, Ohio, Health Commissioner, Ashtabula County General Health District

J. Campbell Kern, M.D., North Central District Health Unit, Lewiston, Ida., Director

John R. McGibony, M.D., Office of Indian Affairs, Washington, D. C., Director of Health

Thomas F. McGough, M.D., Pulaski, Va., Health Officer

William Drummond Radcliffe, Jr., M.D., M.P.H., District Health Officer, Belen, N. M.

Elvin L. Sederlin, M.D., 6 Roberts St., Fargo, N. D., City Health Officer

Charles I. Silk, M.D., 236 High St., Perth Amboy, N. J., Supervisor, Middlesex County Chest Clinic

Joseph R. Smith, M.B., City Hall, Galt, Ontario, Can., Medical Officer of Health

John W. Turner, M.D., 419 N. Third St., Marion, Kans., Marion County Health Officer

Hugh L. C. Wilkerson, M.D., M.P.H., State Board of Health, Indianapolis, Ind., Surgeon, U. S. Public Health Service

Laboratory Section

Fred V. Doutt, B.C.E., Box 487, Canton, N. C., Chief Chemist, The Champion Paper & Fibre Co.

Morris Dworski, B.S., C.P.H., 104½ Park Ave., Saranac Lake, N. Y., Bacteriologist, Laboratory of Trudeau Foundation

Bernice E. Eddy, Ph.D., National Institute of Health, Bethesda, Md., Associate Bacteriologist

Geoffrey Edsall, M.D., 36 Follen St., Cambridge, Mass., Asst. Director, Biologic Laboratories Div., State Dept. of Public Health

Harold J. Fournelle, B.A., Minneapolis Dept. of Health, Div. of Sanitation, Minneapolis, Minn., Asst. Sanitarian

Abraham S. Gordon, M.D., 1376 Union St., Brooklyn, N. Y., Practising Physician

Omer E. Hagebusch, M.D., 4500 Olive St., St. Louis, Mo., Director of five hospital laboratories

Dorothy F. Perry, B.A., 55 Shattuck St., Boston, Mass., Technician-in-training, Harvard School of Public Health

Allan K. Poole, M.D., 107 Whitney Ave., New Haven, Conn., Health Officer, Town of Orange

Dale C. Stahle, M.D., State Dept. of Health, Harrisburg, Pa., Director, Div. of Pneumonia Control

Arthur Sutter, 1517 West Phelps, Springfield, Mo., Breeder of White Mice

Lyle A. Weed, M.D., Ph.D., Indiana University, Medical Center, Indianapolis, Ind.,

Vital Statistics Section

George F. Badger, M.D., M.P.H., 615 N. Wolfe St., Baltimore, Md., Associate in Biostatistics, Johns Hopkins School of Hygiene and Public Health

Jean R. D. Gilley, B.A., 540 Howe St., Vancouver, B. C., Can., Statistical Clerk, Div. of Vital Statistics, Provincial Board of Health

Roslyn L. MacNish, B.S., M.P.H., 10 Blackall Road, Woodmont, Conn., Statistical Asst., Committee on Hygiene of Housing, American Public Health Assn.

Margaret E. Rice, B.A., Tennessee Valley Authority, Wilson Dam, Ala., Asst. Statistical Clerk, Health and Safety Dept.

William H. Veigel, 244 Crestview Road, Columbus, Ohio, Chief, Vital Statistics Division, State Dept. of Health

Engineering Section

Fred M. Ashley, 42 West Culver St., Phoenix, Ariz., Chief Sanitary and Food Inspector, Phoenix Health Dept.

Roy Bremer, A.B., M.S.P.H., Alger-Schoolcraft Health Dept., Manistique, Mich., Sanitarian

Richard F. Greeley, M.S., Old Bridge St., Buzzards Bay, Mass., Chief Operating Engineer, Camp Edwards Sewage Disposal Plant

Robert R. Harris, M.S., 127 North 44th St., Louisville, Ky., Asst. Sanitary Engineer, State Dept. of Health

Vernon L. Harris, State Dept. of Public Health, Boise, Ida., Junior Sanitarian

Patrick J. Monoghan, 200 Florence Ave., Newark, N. J., Asst. Chief Plumbing Inspector, Newark Dept. of Health

Paul A. Scudder, City Hall, St. Petersburg, Fla., Director of Sanitation, Health Dept.

Andrew M. Trupkovitz, 134 Lawn Ave., Stamford, Conn., Food and Sanitary Inspector, City of Stamford

Food and Nutrition Section

S. Ansbacher, Dr.Sc., 50 East 42nd St., New York, N. Y., Research Director, International Vitamin Corp.

Henry E. Becker, Roseland, N. J., President, Henry Becker & Son, Inc.

Elizabeth Frey, B.S., 309 "C" St., Marysville, Calif., District Nutritionist, State Dept. of Public Health

Roy R. Gockley, B.S., 11 West 42nd St., New York, N. Y., Manager, Sales Dept., Dairymen's League Co-Operative Assn., Inc.

Bernice Hopper, M.S., State Dept. of Public Health, Nashville, Tenn., Nutritionist

Leonard C. Huggins, M.B., D.P.H., Bahamas General Hospital, Nassau, Bahamas, B.W.I., Acting Asst. Medical Officer

Helen L. Johnson, B.S., Norton Road, Kensington, Conn., Consultant in Nutrition, State Dept. of Health

Elsa Orent-Keiles, Sc.D., Beltsville Research Center, Beltsville, Md., Associate Nutrition Chemist, Foods and Nutrition Div., U. S. Dept. of Agriculture

Maternal and Child Health Section

Edith M. Baker, Children's Bureau, U. S. Dept. of Labor, Washington, D. C., Principal Consultant in Medical Social Work

Bessie Mae Beach, M.D., 901½ S.R.R. St., Opelika, Ala., Consultant Pediatrician, State Dept. of Health

Nancy D. Campbell, M.D., San Miguel County Health Dept., Las Vegas, N. M., Maternal and Child Health Consultant, State Dept. of Public Health

Mary W. Keefer, M.A., 1940 Biltmore Street, N.W., Washington, D. C., Medical Social Consultant, Children's Bureau, U. S. Dept. of Labor

Harmon Tremaine, M.D., 2314 State St., Boise, Ida., Chairman, Health & Safety Committee, Boise Area, Boy Scouts of America

Laura P. Wells, M.S., 718 Oregon Bldg., Portland, Ore., Contultant in Nutrition, Maternal and Child Health Div., State Board of Health

Public Health Education Section

Virginia H. Campbell, B.S., Richmond Health Bureau, Richmond, Va., Director of Nurses

Dr. William T. Crouch, P. O. Box 484, Mount Hope, W. Va., Registered Pharmacist, MacDonald Drug Co.

Marjorie Edwards, 277 Pine St., San Francisco, Calif., Executive Secretary, California Heart Assn.

Samuel B. English, M.D., Glen Gardner, N. J., Supt. and Medical Director, New Jersey State Sanatorium

Rosemary M. Kent, M.A., 221 Oak Park, Box 123, Norris, Tenn., Health Education Coordinator, Norris Town-Anderson County Health Education Project

Emma M. McLean, 293 Schermerhorn St., Brooklyn, N. Y., Asst. in Health Education, Brooklyn Tuberculosis and Health Assn.

Edna H. Pearson, R.N., 574 Oakwood St., Pittsburgh, 21, Pa., Supervisor of Health Educators, State Dept. of Health

Edith R. Stuckey, 15 East Kinney St., Newark, N. J., Director, Public Information, N. J. Tuberculosis League

Ruth Wadman, A.B., Hotel Seville, Madison Ave. at 29th St., New York, N. Y., Consultant in Medical Social Work, Div. of Crippled Children, Dept. of Health

Public Health Nursing Section

Alice C. Chapin, 1196 Bedford St., Stamford, Conn., Nurse, City Health Dept.

Pearl P. Coulter, M.A., Peabody College, Nashville, Tenn., Associate Professor of Nursing Education

Ruth Havenor, B.S., State Dept. of Public Health, Boise, Ida., Acting Orthopedic Advisory Nurse

Ethel L. Hoffa, City Health Dept., Kalamazoo, Mich., Venereal Disease Case-Finder for Fort Custer Area

Lillian J. Johnston, 10 Chester Ave., White Plains, N. Y., Supervising Public Health Nurse, Westchester County Dept. of Health

Winona Nordlind, Kootenai County Health Unit, Coeur d'Alene, Ida., Senior Nurse

Grace M. Taylor, R.N., Box 197, Grace, Ida., Staff Nurse, Bannack County Health Unit

Margaret S. Taylor, R.N., M.A., 675 Delaware Ave., Buffalo, N. Y., Educational Director, Buffalo Visiting Nursing Assn.

Evelyn T. Walker, 31 Rector Place, Red Bank, N. J., Director of Health and Welfare, Monmouth County Organization for Social Service

Margaret Willhoit, B.S., C.P.H., 602 Glenwood, Kansas City, Mo., Supervisor of Public Health Nursing, Health Dept.

Epidemiology Section

Oscar N. Allen, Ph.D., Dean Hall 201, Univ. of Hawaii, Honolulu, T. H., Professor of Bacteriology

Louis H. Block, M.D., 185 N. Wabash Ave., Chicago, Ill.

Jose C. Bustos, M.D., M.P.H., Diaz Miron No. 17, Jalapa, Veracruz, Mexico, Director of Public Health

Dr. Jose Amador Guevara, 731 Tappan, Ann Arbor, Mich., Student, Univ. of Michigan

Pascal F. Lucchesi, M.D., Municipal Hospital, 4000 N. Front St., Philadelphia, Pa., Supt. and Medical Director, Philadelphia Hospital for Contagious Diseases

Louis Platt, M.D., M.S.P.H., 34 South St., Middletown, N. Y., Asst. District Health Officer, State Dept. of Health

Caroline R. Shreve, 1225 Arctic Ave., Atlantic City, N. J., Director, Atlantic County Public Health Service

Unaffiliated

Felix A. Hennessy, M.D., Calmar, Iowa, Trainee, University of Minnesota

APPLICANTS FOR FELLOWSHIP

In accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility, and the Governing Council will take place at the Atlantic City Annual Meeting.

Health Officers Section

Guillermo Arbona, M.D., M.P.H., Health Officer, Public Health Unit, Rio Piedras, P. R.

Earl P. Bowerman, M.D., M.P.H., Gibson County Health Officer, Trenton, Tenn.

Richard F. Boyd, M.D., M.P.H., Director, Division of Local Health Services, State Board of Health, Topeka, Kans.

Irmel W. Brown, M.D., M.P.H., Director, Kalamazoo City-County Health Department, Kalamazoo, Mich.

Edwin Cameron, M.D., M.P.H., Executive Secretary, State Board of Health, Dover, Del.

W. Ross Cameron, M.D., M.P.H., Deputy State Health Officer, State Department of Health, Baltimore, Md.

Francis M. Carroll, M.D., Commissioner of Health, Health and Sanitation Department, Seattle, Wash.

Donald G. Evans, M.D., D.P.H., Director, State Department of Health, Seattle, Wash.

John W. Ferree, M.D., M.P.H., Director and Secretary, State Board of Health, Indianapolis, Ind.

Richard H. Fletcher, M.D., M.P.H., Assistant Director, State Department of Health, Seattle, Wash.

Joseph P. Garen, M.D., M.P.H., District Health Officer, Saranac Lake, N. Y.

Adelard Groulx, M.D., M.P.H., Director, Department of Health, Montreal, Que., Canada

John F. Hackler, M.D., M.P.H., Director, Field Technical Unit, State Health Department, Oklahoma City, Okla.

John B. Hall, Jr., M.D., M.S.P.H., District Health Superintendent, Cook County Public Health Unit, Chicago, Ill.

Robert H. Hutcheson, M.D., M.P.H., Assistant Commissioner, State Health Department, Nashville, Tenn.

Rutherford O. Ingham, M.D., M.P.H., Health Officer, Washington County Department of Health, Jonesboro, Ala.

Arthur M. Johnson, M.D., Health Officer, Rochester, N. Y.

Matthew R. Kinde, M.D., Field Director, W. K. Kellogg Foundation, Battle Creek, Mich.

John J. Lentz, M.D., Director, Davidson County Health Department, Nashville, Tenn.

Lynn J. Lull, M.D., M.P.H., Director, Division of Venereal Disease Control, State Board of Health, Denver, Colo.

Edward G. McGavran, M.D., M.P.H., Director, West Virginia Public Health Training Center and Monongalia County Health Department, Morgantown, W. Va.

Frederick A. Musacchio, M.D., M.S.P.H., Director, Acadia Parish Health Unit, Crowley, La.

Herbert L. Newcombe, M.D., M.P.H., Director, Kootenai County Health Unit, Coeur d'Alene, Ida.

Edward A. Piszczek, M.D., M.P.H., Health Officer, Cook County Public Health Unit, Chicago, Ill.

Hugh B. Robins, M.D., Director, Calhoun County Health Department, Marshall, Mich.

Gradie R. Rowntree, M.D., M.P.H., Assistant Director of Health and Director, Communicable Disease Control, City Health Department, Louisville, Ky.

Daniel L. Seckinger, M.D., Dr.P.H., Assistant Health Officer, Washington, D. C.

Lawrence J. Smith, M.D., Commissioner of Public Health, Springfield, Mass.

Charles A. Steurer, M.D., Director, Division of Communicable Diseases, Nassau County Department of Health, Mineola, L. I., N. Y.

George M. Uhl, M.D., M.S.P.H., Coördinating Officer, State Department of Public Health, Berkeley, Calif.

Harry Wain, M.D., M.S.P.H., Health Commissioner, Sidney and Shelby County, Sidney, Ohio

Herman G. Weiskotten, M.D., Dean, College of Medicine, Syracuse University, Syracuse, N. Y.

John B. West, M.D., M.P.H., Assistant Bureau Director, Board of Health, Chicago, Ill.

Laboratory Section

Irving H. Borts, M.D., Associate Director, State Hygienic Laboratory, Iowa City, Ia.

Charles M. Brewer, Ph.D., Senior Bacteriologist, Insecticide Division, U. S. Department of Agriculture, Washington, D. C.

J. Howard Brown, Ph.D., D.Sc., Associate Professor of Bacteriology, Johns Hopkins University Medical School, Baltimore, Md.

Donald C. A. Butts, D.Sc., Professor of Bacteriology, Pennsylvania State College of Optometry, Philadelphia, Pa.

Charles M. Carpenter, M.D., M.P.H., Associate Professor of Bacteriology, University of Rochester School of Medicine and Dentistry, Rochester, N. Y.

Katherine E. Cox, A.B., Director, West Virginia State Hygienic Laboratory, Charleston, W. Va.

Lt. Col. Wesley C. Cox, M.D., Dr.P.H., Department Medical Inspector, Medical Corps, U. S. Army, Quarry Heights, C.Z.

Jessie E. Dow, Pd.B., Senior Bacteriologist, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Grace Eldering, Sc.D., Bacteriologist, State Department of Health, Lansing, Mich.

Russell Gottshall, Ph.D., Senior Bacteriologist and Assistant Director, Biologic Products Laboratory, State Department of Health, Lansing, Mich.

Ivan C. Hall, Ph.D., Pd.B., Professor and Head, Department of Bacteriology, University of Colorado Medical School, Denver, Colo.

Walter T. Harrison, M.D., Senior Surgeon, U. S. Public Health Service, San Francisco, Calif.

Lucy S. Heathman, M.D., Ph.D., Assistant Director and Chief of Laboratories, Division of Preventable Diseases, State Department of Health, Minneapolis, Minn.

Charles A. Hunter, Ph.D., Director, Public Health Laboratories, State Board of Health, Topeka, Kans.

J. F. Mahoney, M.D., Director, Venereal Disease Research Laboratory, U. S. Marine Hospital, Staten Island, N. Y.

Catherine R. Mayfield, M.S., Bacteriologist, State Board of Health, Jackson, Miss.

Morris Scherago, D.V.M., Professor of Bacteriology and Head, Department of Bacteriology, University of Kentucky, Lexington, Ky.

Joseph I. Schleifstein, M.D.C.M., Associate Diagnostic Pathologist, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Howard J. Shaughnessy, Ph.D., Chief, Division of Laboratories, State Department of Health, Chicago, Ill.

John T. Tripp, Ph.D., Associate Director of Biologics, State Department of Health, Lansing, Mich.

Henry Welch, Ph.D., Senior Bacteriologist, Food and Drug Administration, Federal Security Agency, Washington, D. C.

Vital Statistics Section

Clyde A. Bridger, M.S., Statistician, State Department of Public Health, Boise, Ida.

Edwin L. Crosby, M.D., Dr.P.H., Assistant Director, Johns Hopkins Hospital, Baltimore, Md.

Ralph C. Fletcher, M.A., Director, Bureau of Social Research, Pittsburgh, Pa.

Marguerite F. Hall, Ph.D., Instructor, Division of Hygiene and Public Health, University of Michigan, Ann Arbor, Mich.

Theodore A. Janssen, M.S., Chief, Nosology Section, Bureau of the Census, Washington, D. C.

Francis E. Kester, Ph.B., Senior Statistician, State Board of Health, Madison, Wis.

Henry J. Klein, B.S., Supervisor, Statistical Bureau, Metropolitan Life Insurance Company, New York, N. Y.

Billy Tober, State Registrar of Vital Statistics and Supervisor of Finance, State Department of Public Health, Santa Fe, N. M.

Robert G. Webster, B.S., Chief Deputy Registrar, Los Angeles County Health Department, Los Angeles, Calif.

Engineering Section

Frank E. DeMartini, B.S., Passed Assistant Sanitary Engineer, U. S. Public Health Service, Washington, D. C.

Paul D. Haney, M.S., Associate Engineer, State Board of Health and Assistant Professor of Sanitary Engineering, University of Kansas, Lawrence, Kans.

Herbert A. Kroeze, B.S. in C.E., Director, Division of Sanitary Engineering, State Board of Health, Jackson, Miss.

Carl E. Schwob, M.S., Principal Sanitary Engineer, State Department of Public Health, Chicago, Ill.

William E. Stanley, C.E., Professor of Sanitary Engineering, Cornell University, Ithaca, N. Y.

Edward Wright, Sanitary Engineer, State Department of Public Health, Boston, Mass.

Industrial Hygiene Section

John Buxell, M.S., Chief Engineer, Industrial Hygiene Service, Health Division, St. Louis, Mo.

Herbert C. Clare, M.S., Director, Division of Industrial Hygiene, State Department of Public Health, Boise, Ida.

Donald E. Cummings, B.S., Professor of Industrial Hygiene, School of Medicine, University of Colorado, Denver, Colo.

Frederick H. Goldman, Ph.D., Chemist, National Institute of Health, Bethesda, Md.

Kenneth E. Markuson, M.D., M.P.H., Director, Bureau of Industrial Hygiene, State Department of Health, Lansing, Mich.

Kenneth M. Morse, M.S., Industrial Hygiene Engineer, State Department of Health, Chicago, Ill.

Food and Nutrition Section

Fuller D. Baird, B.S., Director, Nutritional Laboratory, National Oil Products Co., Harrison, N. J.

Martha Koehne, Ph.D., Nutritionist, State Department of Health, Columbus, Ohio

Helen S. Mitchell, Ph.D., Research Professor in Nutrition, Massachusetts State College, Amherst, Mass.

Charles R. Moulton, Ph.D., Counsellor on Food and Nutrition, Chicago, Ill.

Charlotte Raymond, B.A., Community Nutritionist, Newton Health Dept., (Now Nutrition Consultant to Harvard-Red Cross Unit in England), Newtonville, Mass.

Maternal and Child Health Section

Hugh J. Bickerstaff, M.D., M.P.H., Associate in Public Health Administration, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

Edythe Hershey, M.D., Director of Maternal and Child Health, State Board of Health, Helena, Mont.

Albert McCown, M.D., Dr.P.H., Director, Child Health Project, Kips Bay-Yorkville Health District, New York, N. Y.

Frances C. Rothert, M.D., M.P.H., Regional Medical Consultant, U. S. Children's Bureau, New Orleans, La.

John M. Saunders, M.D., C.P.H., Regional Medical Consultant, U. S. Children's Bureau, Washington, D. C.

Nina Simmonds, Sc.D., Lecturer in Medicine, University of California Medical School, and Lecturer in Nutrition, University of California College of Dentistry, San Francisco, Calif.

George M. Wheatley, M.D., Assistant Medical Director, Welfare Division, Metropolitan Life Insurance Company, New York, N. Y.

Robert G. White, M.D., M.S.P.H., District Health Officer, State Department of Health, Valley City, N. D.

Public Health Education Section

Helen M. Baukin, D.H., Supervising Dental Hygienist, Department of Public Instruction, Honolulu, T. H.

Margaret Bell, M.D., F.A.C.P., Chairman, Department of Physical Education for Women, and Physician, Health Service, University of Michigan, Ann Arbor, Mich.

Muriel F. Bliss, M.Ed., C.P.H., Director of Education, Nassau County Cancer Committee, Mineola, L. I., N. Y.

William Arkwright Doppler, Ph.D., Field Director, Adult Health Education Service, National Tuberculosis Association, New York, N. Y.

Morris Fishbein, M.D., Editor, Journal of the A.M.A. and Hygeia, American Medical Association, Chicago, Ill.

Ethel M. Hendriksen, Instructor, Public Health Education, State Department of Health, Albany, N. Y.

Mildred M. Ihrig, M.A., Supervisor, Welfare Division, Metropolitan Life Insurance Company, San Francisco, Calif.

N. P. Neilson, Ph.D., Executive Secretary, American Association for Health, Physical Education and Recreation, Washington, D. C.

Minnie K. Oed, M.S.P.H., Health Educator, Department of Health, Detroit, Mich.

Ellen C. Potter, M.D., F.A.C.P., Director of Medicine, N. J. Department of Institutions and Agencies, Trenton, N. J.

David Resnick, Director of Publicity, National Society for the Prevention of Blindness and

Henry Street Visiting Nurse Service, New York, N. Y.

David A. Van der Slice, M.D., M.S.P.H., Instructor, Division of Hygiene and Public Health, University of Michigan, and Director, School of Health Service, Board of Education, Ann Arbor, Mich.

Amelia T. Wood, M.D., Director of Health Service and Instructor in Hygiene, Ball State Teachers College, Muncie, Ind.

Mary M. Wyman, A.M., Supervisor of Health and Safety Education, Board of Education, Louisville, Ky.

Public Health Nursing Section

Gladys L. Crain, Director, Visiting Nurse Association, Buffalo, N. Y.

Rena Haig, M.A., Chief, Public Health Nursing Service, State Department of Public Health, San Francisco, Calif.

Epidemiology Section

A. M. Clarkson, M.D., C.P.H., Director, Division of Venereal Diseases, State Department of Health, Austin, Tex.

Burke Diefendorf, M.D., District State Health Officer, State Department of Health, Glens Falls, N. Y.

Robert Dyar, M.D., Dr.P.H., Director, Special Syphilis Study, San Joaquin Local Health District, Stockton, Calif.

Walter C. Earle, M.D., Director, Champaign-Urbana Public Health District, Champaign, Ill.

John E. Elmendorf, Jr., M.D., Staff Member, International Health Division, Rockefeller Foundation, New York, N. Y.

Lloyd J. Florio, M.D., Dr.P.H., Associate Professor of Public Health and Laboratory Diagnosis, University of Colorado, Denver, Colo.

Thomas Francis, Jr., M.D., Professor of Epidemiology, University of Michigan School of Public Health, Ann Arbor, Mich.

Arthur H. Graham, M.D., C.P.H., Director, East Alabama Health District, Opelika, Ala.

William Grossmann, M.D., C.P.H., Director, Bureau of Communicable Diseases, State Department of Health, Richmond, Va.

Ralph H. Heeren, M.D., M.P.H., Assistant Professor of Hygiene and Preventive Medicine and Chief, Division of Communicable Diseases of University Health Department, University of Iowa, Iowa City, Ia.

John H. Korns, M.D., Director, Division of Tuberculosis, Westchester County Health Department, White Plains, N. Y.

Alexander D. Langmuir, M.D., M.P.H., Deputy Commissioner, Westchester County Health Department, White Plains, N. Y.

Alberto P. Leon, M.D., M.P.H., Professor of Preventive Medicine and Hygiene, Medical School, National University, Mexico City, Mex.

Daniel F. Milam, M.D., M.P.H., Field Staff Member, Rockefeller Foundation, Chapel Hill, N. C.

William Mosley, M.D., D.P.H., Director of Field Training, School of Hygiene, University of Toronto, Toronto, Ont., Canada

Hernan Romero, M.D., M.S.P.H., Professor of Preventive Medicine and Hygiene, University of Chile, and Fellow, Rockefeller Foundation, Santiago, Chile, S. A.

Fred L. Soper, M.D., Dr.P.H., Member Field Staff, International Health Division, Rockefeller Foundation, Rio de Janeiro, Brazil, S. A.

Cecil B. Tucker, M.D., M.P.H., Director, Division of Preventable Diseases, State Department of Public Health, Nashville, Tenn.

Samuel L. Wadley, M.D., M.P.H., Director, Bureau of Communicable Diseases and Epidemiologist, Health Department, Memphis, Tenn.

Ruth H. Weaver, M.D., M.P.H., Registrar of Vital Statistics, Department of Health, Philadelphia, Pa.

Willard H. Wright, D.V.M., Ph.D., Professor of Zoölogy and Chief, Division of Zoölogy, National Institute of Health, Washington, D. C.

Harlin L. Wynns, M.D., M.P.H., Chief, Bureau of Epidemiology, State Department of Public Health, Berkeley, Calif.

Unaffiliated

Benjamin R. Allison, M.D., Chairman, Nassau County Board of Health, Hewlett, L. I., N. Y.

Dudley P. Glick, Ph.D., Associate Professor of Bacteriology, Colorado State College, Ft. Collins, Colo.

Jean Gregoire, M.D., Dr.P.H., Deputy Minister of Health, Ministry of Health, Quebec, Que., Canada

Milton I. Levine, M.D., Research Pediatrician, Research Division, Department of Health, New York, N. Y.

Guy G. Lunsford, M.D., Director, Division of Local Health Organizations, State Department of Health, Atlanta, Ga.

Samuel B. McPheeters, M.D., Director of Public Health, Wayne County Health Department, Goldsboro, N. C.

William F. Wells, B.S., Associate Professor of Air-borne Infection and Director of Laboratories for the Study of Air-borne Infection, School of Medicine, University of Pennsylvania, Philadelphia, Pa.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearing house on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

UNASSEMBLED EXAMINATIONS IN WEST VIRGINIA

The Merit System Council of West Virginia, Box 873, Morgantown, has announced that it is expected that unassembled examinations will shortly be given for the following positions in the West Virginia State Health Department.

Position	*Salary per month*
Chief of Medical Services	$325–400
Opthalmologist	275–350
Director of County Health Work	350–400
Director, Maternal and Child Hygiene	350–400
Director, Communicable Diseases	350–400
Director, Vital Statistics	350–400
Director, Industrial Hygiene	350–400
Assistant Director, Maternal and Child Hygiene	320–375
Assistant Director, Communicable Diseases (Venereal)	320–375
Assistant Director, Tuberculosis	320–375
Venereal Disease Consultant	320–375
Senior Health Officer	320–375
Junior Health Officer	280–320
Health Officer Trainee	200

Residence in West Virginia has been waived in consideration of the applications for these positions. However, residents of the state may be given preference in making appointments. Complete information may be obtained by writing to the Merit System Council.

U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer ($4,600), Medical Officer ($3,800) and Associate Medical Officer ($3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veteran's Administration, and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

Junior Public Health Nurse. A civil service examination for Public Health Nurse ($2,000) has been open for some time. Nurses who have been unable to qualify for this examination because of the experience requirement now have an opportunity to qualify through a new Junior Public Health Nurse examination ($1,800) which requires no experience. Applications are also being received for examinations now open for Junior Graduate Nurse ($1,620) and Graduate Nurse for general staff duty ($1,800). Further information and application forms may be obtained at any first or second class post office or from the Civil Service Commission, Washington.

POSITIONS AVAILABLE

Young woman, trained in Home Economics, for group contact work in behalf of an important commercial organization whose products are useful in the protection of public health and the National Nutrition Program. Experience in the public health field or related fields is essential. Office in New York, some travel involved. Write **Box H**, Employment Service, A.P.H.A.

Public Health Engineer with the Department of Health of a city of 100,000 population in the Midwest. Give age, training, experience and references. Write **Box M**, Employment Service, A.P.H.A.

Southern State Department of Health seeks physicians qualified by training and experience as County Health Officers or as Pediatricians. Write **Box B**, Employment Service, A.P.H.A.

Western State Department of Health will consider applications from physicians with experience and a degree in public health. Write **Box S**, Employment Service, A.P.H.A.

Sanitary Chemist for sewage laboratory in eastern city. Salary $2,000. Graduate preferred. Write **Box V**, Employment Service, A.P.H.A.

Physician with public health training to serve as full-time county health officer in rural South Atlantic area. Salary

$3,600 to $4,000. Write **Box C**, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have 4 months' postgraduate instruction under one of the recognized public health nursing courses and 1 year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, New Mexico.

POSITIONS WANTED

The Employment Service is in touch with specialists in several branches who wish teaching positions.

ADMINISTRATIVE

Physician with M.P.H. from Johns Hopkins, experienced as county and district health officer, seeks responsible administrative position. **A-458**

Physician with Dr.P.H. from Johns Hopkins, special interests in mental hygiene and epidemiology, well experienced in teaching, will consider administrative, teaching or investigating work. **A-486**

Physician with M.P.H. from Johns Hopkins 1924, experienced as state director for communicable diseases, as county health officer and as director of field training center, will consider responsible position with good income. **A-483**

Physician, graduate of the University of Iowa, candidate for Dr.P.H. at Harvard, seeks good administrative position. **A-476**

Physician, aged 44, graduate of Rush Medical, M.P.H. from Johns Hopkins 1941, and experienced as director of rural health unit, will consider opening. **A-480**

Physician, aged 39, excellent graduate training and experience in public health, specialized in tuberculosis and epidemiology, now employed, will consider position with salary of $4,500 or better. **A-473**

Experienced physician, graduate University of Illinois, M.P.H. Johns Hopkins 1940, seeks administrative opening suitable to his proven ability. Excellent references. **A-466**

Dentist, University of Pittsburgh, D.D.S., M.P.H. University of Pennsylvania 1941, experienced in practice, wishes an administrative position in public health, preferably at state level. **M-450**

HEALTH EDUCATION

Woman with M.S. in public health, University of Michigan; and Ph.D. in health education, New York University; experienced in public schools, teachers colleges, and community public health, now employed as health teaching supervisor, will consider position in school, organization or industry. **H-236**

Young woman with Master's degree in Health Education, Teacher's College, Columbia University, and background of clinical laboratory work and biochemistry, seeks position as health educator in research or as laboratory assistant in public health. **H-494**

Health Educator, man 32, M.S.P.H., with excellent training and varied experience in education and public health. Would expect salary of $3,000. Prefers national or state organization. Excellent references. **H-405**

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. **H-497**

Young woman, M.S.P.H. University of Michigan, specialized in adult and community health education, seeks position. Experienced in administrative work in commercial field and in teaching. Available now. **H-496**

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public Health nurse, able to teach mental and social hygiene as well as general health education. East preferred. **H-498**

LABORATORY

Experienced Bacteriologist. Man, 56 with long record as successful university teacher, research worker and head of department of bacteriology and public health, desires new location in educational, research or public health organization. Available at once. **L-462**

Laboratory Director, unusually well qualified and experienced man, aged 41, Ph.D. with training at Michigan, M.I.T., and Maryland. Excellent references. Will consider administrative, teaching or research position in public health. **L-459**

Experienced woman bacteriologist, now employed, graduate Iowa State College 1925, 6 months on Fellowship at Johns Hopkins 1930, wishes position in serology, bacteriology or research. **L-458**

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology, and serology, will consider opening. **L-427**

Experienced laboratory technician. Woman with 17 years in large midwest municipal laboratory. Has 12 years' background in the Kahn test. Excellent ref-

erences. Immediately available. Will consider any location. **L-460**

SANITARY ENGINEERING

Engineer, aged 38, 3 years' experience as district sanitary supervisor, state department of health, together with work on plumbing, heating, and ventilation. Will consider position in the plumbing or heating field or state department of health. Prefers middle western or western states. **E-453**

Public Health Engineer, M.S. Harvard, experienced in public health and industrial hygiene, wishes position of better sort in public health engineering or industrial hygiene. **E-470**

Public Health Engineer, M.S. Harvard, with more than 10 years' experience including 5 years with state division of sanitation, is available. **E-468**

STATISTICAL

Public Health Statistician. Young man, M.S.P.H. Michigan, now employed as supervisor of state health project, experienced in medical economic research, epidemiology studies and vital statistics, seeks position in city or state health department in midwest. **S-458**

Advertisement

Opportunities Available

PUBLIC HEALTH PHYSICIANS—(a) Physicians who has specialized in obstetrics and pediatrics, with semester's training in public health, for interesting appointment; state health department. (b) Young physician (under 35) trained or interested in public health work for county health appointment; man over 35 eligible if thoroughly experienced. (c) Venereal disease control officer; city of 70,000; should be able to take charge of new duties by October 1. (d) Physician interested in research in leprosy, but willing to do some general practice; opening in country enjoying unusually mild climate. (e) District health physicians for 9 month replacement appointments; yearly rate $4,250–$4,500, plus travel allowance; possibility permanancy. PH9–1, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago. (f) Director, health service, public school system; midwestern city of 100,000.

PUBLIC HEALTH NURSE—(a) For division of venereal disease control, city of nearly 150,000; duties consist of interviewing patients and making home visits for case finding and case holding, plus rotating attendance at evening clinic with two other nurses; $1,560, plus auto allowance. (b) Junior and senior public health nurses for appointments in state health department; $135–$160; generalized program. (c) Teaching supervisor for outpatient department, fully approved hospital; degree, experience required; California. (d) College nurse; duties include routine care of infirmary patients, assisting in dispensary and health clinic; 10 bed infirmary; should be interested in educational aspects which every health difficulty affords; excellent opportunity for one wishing to specialize in health service; New England. PH9–3, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

BACTERIOLOGIST—For instructorship in university; work involves taking charge of laboratory work in general bacteriology for class of 80 students; public health course will include water and milk analyses, disinfectant testing, and some work with foods other than milk; about $2,500. PH9–4, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—For vacancies in men's and women's divisions of university health service; teaching experience required; large department, offering opportunities for advancement in student health work. PH9–2, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

Situations Wanted

Certified public health physician; Bachelor's and medical degrees from southern university; C.P.H., Johns Hopkins; 4 years, director student health service, state university; 5 years, executive position with state health department. PH9–5, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

Public health nurse executive; B.S. in Nursing Education; M.S. in Health Education; certificate in Public Health Nursing; record of successful executive experience in public health field. PH9–6, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

Public health nurse; fairly recent graduate of midwestern training school; certified public health nurse. PH9–7, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

Bacteriologist; A.B., Ph.D., state university; 6 years, university laboratory of animal pathology; 4 years, parasitologist, state department public health. PH9–8, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

THE NEW YORK MEDICAL EXCHANGE

A—Public health physician, venereal disease control, South, $3,200–$3,600.

B—Medical officer, charge of 25 bed hospital, trained in surgery, Newfoundland, $2,400 full maintenance, private practice permitted. New York Medical Exchange (Patricia Edgerly, Director) 489 Fifth Avenue, New York, N. Y.

NEWS FROM THE FIELD

HAITI CONFERENCE ON GULF AND CARIBBEAN HEALTH

DR. MIGUEL E. BUSTAMANTE, Director of the Laboratory of Epidemiology and Biostatistics, Institute of Health and Tropical Diseases, Mexico, D.F. has written of the Conference of Caribbean and Gulf Nations recently held in Port-au-Prince, Haiti. The conclusions of the Public Health Section are in agreement, according to Dr. Bustamante, with the editorial on the Caribbean Area and Tropical Health in the May *American Journal of Public Health* (page 505).

These recommendations propose the formation of public health societies in the Caribbean and Gulf countries, with the aim of eventually having an international affiliation.

It was proposed that the *International List of Causes of Death* should be uniformly used for mortality records and that similar uniform methods should be used for the reporting of communicable diseases.

It was further proposed that the Puerto Rico School of Tropical Medicine, the Institute of Health and Tropical Diseases of Mexico, the Finlay Institute of Cuba, and the Gorgas Laboratories of Panama should be developed as centers for advanced study by the health workers of the Gulf and Caribbean countries. Fellowships for this purpose ought to be established, in the opinion of the meeting.

The Public Health Section recommended that such institutions as the School of Malariology at Caracas, Venezuela, should be used for training personnel from other countries.

The section further declared that yellow fever has been eradicated from the Caribbean area and that it was highly necessary to maintain with great care the present status with regard to this and other similar diseases.

U. S. INDIAN SERVICE TUBERCULOSIS STUDY

DR. HORACE DELIEN, Special Physician in Tuberculosis Control of the Indian Service for California, Nevada, and Utah, with headquarters in San Francisco, Calif., has been assigned to the duties of Special Expert in Tuberculosis, a position formerly held by Dr. Joseph A. Aronson, who has been called to duty in the U. S. Army. Under the new assignment, Dr. DeLien will continue the studies in vaccination with BCG which were initiated by Dr. Aronson. Vaccinated groups and controls among Indian children are being observed in North Dakota, South Dakota, Wyoming, Arizona, and Alaska. Dr. DeLien will continue to supervise the general tuberculosis control program of the Indian Service in the states under his former assignment.

NEW LABORATORY TO STUDY VIRUS DISEASES

A LABORATORY will be established at the University of Michigan, Ann Arbor, under a grant of $30,000 from the National Foundation for Infantile Paralysis. The laboratory will temporarily be operated in the University Hospital but on completion of the new School of Hygiene and Public Health will be transferred there. Infantile paralysis and other virus diseases

will be studied in the new laboratory, and field studies in nearby communities will be made to promote the work.

IOWA PUBLIC HEALTH ASSOCIATION

AT its recent Annual Meeting the Iowa Public Health Association elected the following officers to serve for the coming year:

President—Harry H. Ennis, M.D., Decorah
President-elect—R. M. Sorensen, M.D., Des Moines
Vice-President—Grace Haven, R.N., Waterloo
Secretary-Treasurer—Carl F. Jordan, M.D., Des Moines

SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION

AT its recent Annual Meeting, the South Carolina Public Health Association elected the following officers to serve for the ensuing year:

President—A. W. Humphries, M.D., Camden
President-elect—J. E. Brodie, M.D., Greenwood
1st Vice-President—G. A. Bunch, D.D.S., Columbia
2nd Vice-President—S. B. Pringle, Beaufort
Secretary-Treasurer—Mrs. Frank George, R.N. Columbia

THE MAY BILL BECOMES LAW, JULY 11, 1941

THE U. S. Congress has enacted and the President has signed Public Law 163, 77th Congress, Chapter 287, 1st Session (H.R. 2475) commonly known as the May Bill, an act to prohibit prostitution within such reasonable distance of military or naval establishments as the Secretaries of War and Navy shall determine to be needful to the efficiency, health, and welfare of the Army and Navy.

Until May 15, 1945, the Bill provides that prostitution shall be unlawful under federal authority. The Secretaries of War and of the Navy and the Federal Security Administrator are authorized and directed to take such steps as they deem necessary to suppress and prevent prostitution and to accept the coöperation of the authorities of states and their counties, districts and other political subdivisions, in carrying out the purposes of the act. Authority, however, is not granted to the personnel of the War or Navy Department or the Federal Security Agency to make criminal investigation, searches, seizures, or arrest of civilians charged with violations of this act.

PUBLIC WORK RESERVE

THE Public Work Reserve has been set up in the Federal Works Agency in Washington for the purpose of building a national "shelf" of public works programs that may be undertaken by local, state, and federal agencies in the post-defense period and which will include both capital improvements and public services. The Public Work Reserve will operate under the sponsorship of the Federal Works Agency and the co-sponsorship of the National Resources Planning Board, and, with the assistance of the Work Projects Administration, will prepare information, data and estimates which may be used in the establishment of a reservoir of public programs for the post-emergency period and to stimulate state and local governments and public and professional groups on these post-defense problems.

SYMPOSIUM ON INDUSTRIAL HEALTH AT THE MEDICAL COLLEGE OF VIRGINIA

THE second Symposium on Industrial Health, to be held in the Simon Baruch Auditorium at the Medical College of Virginia, September 11 and 12 has been announced by Dr. Fred J. Wampler, Professor of Preventive Medicine. There will be no registration fee.

Participating in the symposium, among others, will be Walter B. Martin, M.D., Norfolk, J. B. Porterfield, M.D., Richmond, E. C. Harper, M.D.,

Richmond, Russell R. Jones, M.D., Pittsburgh, W. J. McConnell, M.D., New York City, Louis Schwartz, M.D., Bethesda, Harry B. Stone, M.D., Roanoke, George H. Cross, M.D., Chester, Pa., Rudolph C. Thomason, M.D., Richmond, C. N. Scott, M.D., Nitro, W. Va., Professor Philip Drinker, Boston, John H. Foulger, M.D., Wilmington, Del., T. Lyle Hazlett, M.D., Pittsburgh, H. Page Mauck, M.D., Richmond, Murray B. Ferderber, M.D., Pittsburgh, Professor Donald E. Cummings, Denver, Colo., Thomas Beath, M.D., Richmond, Henry C. Marble, M.D., Boston, and Sumner L. Koch, M.D., Chicago.

SYMPOSIUM ON AIR-BORNE INFECTION

THE program of Section N of the American Association for the Advancement of Science, at the Chicago meeting, September 22–23, will be devoted to aerobiology. It is expected that the Symposium on Air-borne Infection and Its Control will be something of a milestone in the history of control of respiratory infection. Dr. Malcolm Soule is the Chairman. The program was organized in coöperation with the Committee on Aerobiology of the National Research Council.

HARVARD SCHOOL OF PUBLIC HEALTH

THE Department of Industrial Hygiene of the Harvard School of Public Health will give another short course in Industrial Hygiene similar to the one just finished for Naval Medical Officers. This will start with the opening of the school year, September 22, and will close a few days before Christmas. The course will be open to properly qualified engineers, as well as doctors. Tuition for this new course will be $200.

PUBLIC HEALTH WORKERS IN DEFENSE

ONE hundred and thirty-four new public health workers have been assigned to state and local health departments throughout the nation by the U. S. Public Health Service to assist states in coping with special public health problems created by the national defense program.

The new personnel completed the Public Health Service orientation course of one month at the National Institute of Health, Bethesda, Md., and are now on duty in the field. Forty-one physicians, 39 nurses, 51 sanitary engineers, and 3 laboratory technicians are included in the new personnel.

Congress has authorized the continuance of emergency defense and sanitation activities of the Public Health Service, and in addition has provided funds for training engineers for malaria control work in southern states. They will begin their training at the expanded field station at Norfolk, Va., with headquarters in the Norfolk Marine Hospital. The program will be conducted in coöperation with the Virginia State Department of Health.

TRAINING NURSES FOR NATIONAL DEFENSE

SURGEON GENERAL THOMAS PARRAN announced that active steps are being taken to alleviate the present acute shortage of qualified professional nurses vital to national defense. One of the first moves in this direction was the recent appropriation by Congress of $1,200,000 for training nurses for national defense. These funds are being administered by the States Relations Division of the U. S. Public Health Service. They will be used for increasing the number of students in basic nursing education programs, in preparing inactive graduate nurses for active duty, and in offering postgraduate instruction in special fields of study.

Letters have been sent to all accredited schools of nursing in the country to determine how each can participate in the program of expanding the nation's nursing strength. Those plans

submitted by schools of nursing, hospitals, and other institutions concerned with the education of nurses which provide for the most effective increase of the best qualified nurses in the most economical way will be given preference.

The Public Health Service plan for administering the funds was endorsed by the three principal nursing groups working specifically on national defense, who convened in Washington for a 3 day conference early in July. They are the Sub-committee on Nursing of the Health and Medical Committee of the Federal Security Agency, which called the meeting with the Nursing Council on National Defense and the National Committee on Red Cross Nursing Service. They also drafted a master blueprint for mobilizing the country's nursing strength for the duration of the present unlimited emergency. An intensified program of nursing recruitment throughout the country was outlined by leading members of the nursing profession who were in attendance.

NATIONAL FOUNDATION FOR INFANTILE PARALYSIS

THE distribution by the National Foundation for Infantile Paralysis of new grants totaling $195,030 with which to carry on its battle to conquer infantile paralysis was announced by Basil O'Connor, New York, President of the Foundation. The following grants have been made:

School of Public Health, University of Michigan, Ann Arbor, Mich.—$40,000
Tuskegee Institute, Tuskegee, Ala.—$2,000
Department of Pediatrics, University of Michigan, Ann Arbor—$7,400
University of Minnesota, Minneapolis, Minn.—2 grants totaling $5,600
University of California Medical School, San Francisco—$4,250
New York Orthopaedic Dispensary and Hospital, New York, N. Y.—$1,750
Hospital for Joint Diseases, New York, N. Y.—$1,700
New York Society for the Relief of the Ruptured and Crippled, New York, N. Y.—$1,000
National Organization for Public Health Nursing, New York, N. Y.—two grants totaling $23,400
National League of Nursing Education, New York, N. Y.—$8,500
Children's Hospital, Boston, Mass.—$6,300
Massachusetts General Hospital, Boston, Mass.—$2,500
Boston City Hospital, Boston, Mass.—$3,000
Strong Memorial Hospital, University of Rochester, Rochester, N. Y.—$9,200
University Hospital, The State University of Iowa, Iowa City—$7,000
State University of Iowa—$3,000
Michael Reese Hospital, Chicago, Ill.—two grants totaling $7,930
Department of Surgery of the University of Chicago—$720
Department of Bacteriology and Parasitology of the University of Chicago—$4,980
Children's Hospital, Baltimore, Md.—$400
The Johns Hopkins University School of Medicine, Baltimore, Md.—$9,300
Department of Bacteriology of the University of Southern California School of Medicine, Los Angeles, Calif.—$5,000
City Hospital, Cleveland, Ohio—$5,300
Bureau of Laboratories, Michigan Department of Health, Lansing, Mich.—two grants totaling $13,900
Connaught Laboratories, University of Toronto, Toronto, Canada—$8,800
New York State Department of Health, Albany, N. Y.—$12,000

AWARD OF MERIT TO PEORIA HEALTH OFFICER

THE Northwestern University Alumni Association has recently presented to Dr. S. M. Miller, Commissioner of Health of Peoria, Ill., an award of merit "in recognition of worthy achievement which has reflected credit on Northwestern University and each of her alumni."

Dr. Miller became Health Officer in 1935, since which time a reorganization of the Health Department has taken place with the establishment of an independent Public Health Board through legislative enactment and an independent tax authorization which has increased the revenue for the Health Department from 30 cents to 85 cents per capita.

PERSONALS

Central States

DANIEL C. BARRETT, M.D.,† Medical Director of the Health Unit at Washington, Iowa, has been appointed to a similar position with the Bloomington district of the Indiana State Board of Health, succeeding DR. LEWIS C. ROBBINS,† who has gone to Washington, D. C., to join the U. S. Public Health Service.

OTTO K. ENGELKE, M.D., who for the past year has been a Fellow in Public Health Administration with the W. K. Kellogg Foundation of Battle Creek, Mich., has been appointed Director of the Washtenaw County Health Unit, Mich., effective July 16.

FLOYD M. FELDMAN, M.D.,† who has been Director of District No. 3 in the Minnesota State Department of Health, Rochester, has been appointed Health Officer of Rochester, Minn., succeeding DR. THOMAS B. MAGATH of the Mayo Clinic staff.

JAMES B. GRIFFITH, M.D., Health Officer of Crawfordsville, Ind., has been appointed in charge of the Montgomery County Health Department, succeeding the late DR. FRED A. DENNIS.

CECIL E. JOHNSON, M.D., Rensselaer, Ind., has been appointed Health Officer of Jasper County, succeeding the late DR. ARTHUR R. KRESLER.

JOHN W. PAHMEIER, M.D., Sandborn, Ind., has been appointed Health Officer of Knox County, succeeding the late DR. JOSEPH L. REEVE, Edwardsport.

RUSSELL P. REYNOLDS, M.D., Elizabethtown, Ind., has resigned as Health Commissioner of Bartholomew County, where he will engage in the practice of medicine at Garrett.

CLINT C. SOURWINE, M.D., of Brazil, Ind., has been appointed Health Officer of Clay County to succeed DR. JOHN M. PALM, Brazil, who has been called to army service.

HERBERT N. WALKER, M.D., of Evansville, Ind., has been appointed by the Board of Education of Hartford, Conn., as Director of Physical Education and Health Education. DR. WALKER will succeed CHARLES C. WILSON, M.D., who has accepted an appointment to the staff of Teacher's College, Columbia University, New York, N. Y.

Eastern States

CLAUDE P. BROWN, M.D.† formerly Director, Biological Laboratories of the National Drug Company, Philadelphia, Pa., has been appointed Assistant Director of the Pennsylvania State Board of Health Laboratories, Philadelphia.

ARTHUR H. CUMMINGS, M.D.* formerly District State Health Officer with the New York State Department of Health at Binghamton, has been appointed Senior Surgeon, U. S. Public Health Service (R) and has been assigned to the Virginia State Department of Health and to act as Director of the City Health Department at Portsmouth, Va.

ESMOND R. LONG, M.D.,* Philadelphia, Pa., Professor of Pathology at the University of Pennsylvania School of Medicine, and Director of the Henry Phipps Institute, has been elected an honorary member of the Atheneum of the History of Medicine of Buenos Aires.

ELLA ROBERTS, M.D., has been appointed Medical Director of the Children's Health Hospital, succeeding DR. OSWALD F. HEDLEY, U. S. Public Health Service, who served as acting director while making a survey of rheumatic fever in Philadelphia, Pa.

---

* Fellow A.P.H.A.
† Member A.P.H.A.

Southern States

W. D. BURKHALTER, M.D.,† formerly Associate Director of County Organization, Alabama State Health Department, has just been elected as Shelby County Health Officer at Memphis, Tenn.

JAMES W. CHAPMAN, M.D.,* who has been the Director of Maternity and Child Health with the Missouri State Department of Health, Jefferson City, since 1937, has resigned to become Director of District Health Department No. 3 for the counties of Antrim, Charlevoix, Emmet and Otsego in Charlevoix, Mich.

HUBERT D. CROW, M.D., Health Officer of Lawrenceville, Va., has been transferred to Southampton County.

SIDNEY FRANKLIN, M.D., M.S.P.H.,† has recently resigned as Health Officer of Butler County, Ky., to accept the position of Director of District Department of Health No. 6 in Michigan. This district comprises Luce and Mackinac Counties, with central office in Newberry.

FRANK M. HALL, M.D., Athens, Ala., who has been on leave of absence doing graduate work at Johns Hopkins University, will return as Health Officer of Limestone County.

JOSEPH HIRSH,† formerly with the U. S. Public Health Service and the Office of Education, has been appointed Social Economist in the Public Services Research Section of the Public Work Reserve in Washington. MR. HIRSH's special responsibility will be in the welfare and health field where it is expected that a reservoir of useful and needed public programs for the post-emergency period will be set up.

RUTHERFORD O. INGHAM, M.D.,† Athens, Ala., has resigned as Health Officer of Limestone County to accept a similar position in Johnson City, Washington County, Tenn.

ROSCOE P. KANDLE, M.D.,† Director of the Biparish Health Unit, composed of Winn and Grant parishes, has been appointed Regional Director of the northern district of Public Health in Louisiana, with offices located in Monroe.

ELISHA M. MOORE, M.D., of Centerville, Ala., is now Health Officer of Sumter County.

IVA G. MURPHY, M.D.,† has been appointed Health Officer of Greene County, Ala.

CHARLES L. SAVAGE, M.D.,† of Ashland, Va., has resigned as Health Officer of Hanover County to enter the field of industrial medicine. He will be succeeded by DR. JOHN D. HAMNER, JR.,† Courtland, formerly in Southampton County.

JAMES P. SHARON, M.D.,† has been appointed Director of Venereal Disease Control in the State of Nebraska, at Lincoln. DR. SHARON has been serving at Ft. Leonard Wood, Mo., and since 1936 has been connected with the Iowa State Department of Health.

CAPTAIN JAMES M. SUTER, M.D.,† formerly Health Officer of Bristol-Washington County, Va., has been ordered to duty with the U. S. Army and is now stationed at Fort Eustis, Va., Coast Artillery Replacement Center, and his position there is Post Medical Inspector. DR. JOHN G. MCNIEL,† Bristol, formerly Health Officer of Montgomery County, will succeed DR. SUTER.

WILLIAM P. TERRY, M.D., Charlotte Court House, Va., Health Officer of Charlotte County, has been called to military service. His successor is DR. PAUL W. BOWDEN, Baltimore, Md., who has just completed a course in public health at Johns Hopkins University.

JOHN M. WALTON, M.D., who had been

---

* Fellow A.P.H.A.
† Member A.P.H.A.

associated with the Atlanta, Ga., Department of Health, has been appointed State Venereal Disease Control Officer. He succeeds DR. AARON WILSON BROWN.

MARY WALTON, M.D., Opelika, has been named Health Officer for Chilton County, Ala., succeeding DR. ROBERT W. CROWELL, Clanton.

DANIEL J. WILLIAMS, M.D., Gulfport, Miss., Health Officer of Harrison County since the unit was first established 26 years ago, retired from the position. He has been succeeded by DR. EVERETT W. RYAN, Charleston, Health Officer of Tallahatchie County.

HUNTINGTON WILLIAMS, M.D.,* Commissioner of Health of Baltimore, Md., left by air on July 12 for London, as one of a group representing the Office of Civilian Defense, Washington, D. C. According to the press DR. WILLIAMS said that he would specialize in first aid measures and in the rescue of persons from bombed buildings and the provision of medical care.

EMMETT J. YOUNG, M.D., Arcadia, La., Health Director of Bienville Parish, has been named to a similar position in Lincoln Parish, succeeding DR. NELSE P. LILES, JR., of Bastrop, who took over the Directorship of Health Units in Morehouse and Union parishes.

Western States

CHARLES W. ARTHUR, PH.B.,† who for 21 years has been Bacteriologist in the Pasadena City Health Department, Pasadena, Calif., has been appointed Acting City Health Officer to succeed WILTON L. HALVERSON, M.D., who has resigned to become County Health Officer of Los Angeles County.

WILTON L. HALVERSON, M.D.,* DR.P.H., Health Officer of Pasadena, Calif., has been appointed County Health Officer of Los Angeles, Calif., succeeding DR. JOHN L. POMEROY,* deceased.

WILLIAM LEVIN, D.P.H.,* of Portland, Ore., Director of the Hygienic Laboratory of the State Board of Health for the past 18 years, has been called to military service.

JOHN R. SEELEY, M.D., has resigned as Health Officer of Coos County, Ore., to enter private practice.

Nassau, Bahamas

LAWRENCE W. FITZMAURICE, M.D., D.P.H.,† has been appointed acting Chief Medical Officer and Chairman of the Health Board of the Bahamas during the absence from the Colony of DR. JOHN M. CRUIKSHANK,† who is serving with the Royal Canadian Air Forces.

Canada

JOHN T. MARSHALL,* formerly Director of Vital Statistics for the Provincial Board of Health in Victoria, B. C., has been appointed Chief of Vital Statistics of the Dominion Bureau of Statistics at Ottawa.

DEATHS

DR. GEORGE PARRISH,* Los Angeles City Health Officer for the last 15 years, died on August 7 following an abdominal operation, at the age of 69. DR. PARRISH, who was a graduate of Washington University School of Medicine, St. Louis, after spending five years in the St. Louis Health Department, became Commissioner of Health of Portland, Ore., in 1917, serving until 1924.

HALSEY JAY BALL, M.D.,* Cape May, N. J., for many years associated with the New York State Health Department as health officer of various towns and district health officer, died May 31.

ALPHONSE LESSARD, M.D., Quebec,

* Fellow A.P.H.A.
† Member A.P.H.A.